DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2004

WEDNESDAY, APRIL 9, 2003

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:03 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Cochran, Shelby, and Inouye.

DEFENSE AGENCIES

MISSILE DEFENSE AGENCY

STATEMENT OF LIEUTENANT GENERAL RONALD T. KADISH, USAF, DIRECTOR

ACCOMPANIED BY THOMAS P. CHRISTIE, DIRECTOR, OPERATIONAL TEST AND EVALUATION

OPENING STATEMENT OF SENATOR TED STEVENS

Senator STEVENS. Our distinguished co-chairman is stuck in traffic.

General KADISH. So were we, sir.

Senator STEVENS. Since it took me a long time to get in this morning and I only live 5 miles away, I appreciate what you're saying. He has asked us to proceed, if that's all right, and we'll do that.

We welcome you and Mr. Christie, General. Thank you for being with us. You're really a trusted partner in the whole endeavor for national missile defense, and I'm sure Senator Inouye will make similar comments. This capability that you have in Alaska is very encouraging to us and we plan to go up there as soon as possible. We had one trip scheduled and had to cancel it. Our staff will be going over to Hawaii in the coming recess to visit that area, and we know that there has been a great deal of change. If it's possible, we'd enjoy both of you coming to join us on our trip, but I'm not sure that will be possible. We haven't got it scheduled yet because of the problems we have in the appropriations process right now.

We look forward to receiving an update from you, and Senator Inouye will make some comments when he comes in, but right now, I would appreciate it if you would proceed with your statement.

General KADISH. Thank you, Senator. Good morning, Mr. Chairman, members of the committee. I would like to take just a few minutes to highlight some of the key points about our missile de-

fense program that we have today and really underscore the progress we've made to date.

And if you would allow that my prepared statement in its entirety be——

MISSILE DEFENSE PROGRAM

Senator STEVENS. Your statements will go in the record.

General KADISH. In early 2001, we started restructuring the missile defense program to develop capabilities to defend the United States, our allies, our friends, and our deployed forces against all ranges of missiles in all phases of flight. With the support of Congress and in particular this committee, we have made considerable progression in demonstrating key missile defense technologies and the integration of those technologies into a system.

Our testing analysis gives us confidence that hit-to-kill technology works and that we can take the initial steps we are proposing to provide a modest initial defensive capability where none exists today.

Altogether, we have made great progress in our missile defense program. Our testing has been aggressive and productive. Over the past 2 years we achieved four for five successful ground-based intercepts of long-range targets and we are three for three in our sea-based intercepts of medium-range targets. We were five for seven with the Patriot Advanced Capability, or PAC–3 interceptor.

We are making steady progress with the airborne laser to develop the revolutionary speed of light technologies, but we have had failures and in all probability, we will have some more failures in this process. But this score card has increased our confidence in our basic technical approach.

Last December, the President directed the Department of Defense to field an initial set of missile defense capabilities in view of our technical progress, and our total lack of missile defenses against the intermediate and long-range ballistic missiles. Given our fielding approach using the testbed we have been working on, and given our testing successes and our analysis of those to date, I believe we are ready for this step. With the President's decision, we now have a clear basic near-term architecture for a limited system to address a range of missile threats.

I want to stress that we have no fixed long-term architecture, however. We will evolve and improve the capability of the Block 04 system over time so that when we propose to field initially—so what we propose to field initially in fiscal year 2004 and fiscal year 2005 may evolve to look very different maybe a decade later.

EVOLUTIONARY CAPABILITY-BASE ACQUISITION APPROACH

The number and type of missile defense assets and their locations and basing parameters may be expected to change to make the system more integrated and more capable. This is consistent with the approach I have described in previous hearings. We are building and fielding limited military useful capabilities as soon as they can be made available.

We have said all along that when we do field, we will not have a system that will fully meet our missile defense needs, so there are no illusions there. The system we will be fielding initially will

be modestly operational, but we went down this road knowing we would need improvement and we have a process that's specifically designed to make those improvements as soon as practicable.

With an evolutionary capability-based acquisition approach, we put capability into the field, we test it, use it, get comfortable with it, learn what works well and what doesn't, and improve it as soon as we can. Before the President's decision, the fiscal year 2004 President's budget would have reflected the development of a set of testbed capabilities that could have been made operational. Today we are asking Congress to authorize and appropriate funds to allow us to add to this testbed and make it operational in fiscal year 2004.

OPERATIONAL TESTBED

In other words, instead of building a testbed that might be used operationally, we are fielding an initial defensive capability that we will continue to test. Because of this relationship between initial defense capability and testing, we are asking that all associated funding with both efforts be under the defense-wide appropriations funding.

Now with respect to the issue of operational testing before deployment, I would argue that we are faced today with some timely issues. This is a unique and unprecedented technology in its early stages of maturity. We have to strike a balance between our desire for perfection in missile defenses that we employ and our desire to have as soon as possible some defensive capability which does not exist today.

We can continue to test the elements and components of the system and we can use them to defend ourselves. I believe we can do this because we have shown that the nuts and bolts of the missile defense system and its capabilities we are funding to build upon Block 04 can work.

Over the past 2 years, we have conducted a total of 55 flight tests and 60 ground tests. Seventeen of these tests were intercept flight tests. These tests built our confidence. We know hit-to-kill works. We have had a significant degree of repeatability represented in the testing up to date, and we are well along our goal of demonstrating this reliability.

Mr. Christie will state that our relationships, I believe, that we are building between Operational Test and the Missile Defense Agency are in good shape, and that we are structured to make the best decisions in the interests of missile defense.

Regardless of the names we apply to our testing, we must have the assets and infrastructure in the field if we are going to begin to test the system in operationally realistic conditions. If we do not have the weapons and sensors fielded in operationally useful locations, we cannot really do a good job of looking at how they work. This program and its budget proposes to do just that.

Our intentions are to test the complete system as soon as possible. Over the next 2 years we are planning another 68 flight tests, 58 ground tests, and about the same number of intercept tests as before. We have done the testing and have confidence to proceed, and we want to continue to strike the right balance in the testing effort.

The elements of the testbed will also have some inherent defensive capability. We can do operational testing while having the system on alert. We should take advantage of that.

I believe, Mr. Chairman, that we are ready to take the next step in missile defense for another reason. Our testbed evolutionary approach to a missile defensive capability is rational from a cost standpoint as well. We do not now have adequate understanding of our long-term architecture to submit a budget committing tens of billions of dollars, and we don't need to submit such a budget to achieve our goals in the interim.

FIELD CAPABILITY

We are able, however, to purchase a fielded capability, through small numbers, and this approach will allow us to control costs. With an increase of about $1.5 billion over 2 years, we can provide this country with a modest missile defense capability where none exists today.

Mr. Chairman, America's missile defense program is on track. The Missile Defense Agency is doing what we told Congress it would do, and your support has been important to the progress we have made. We listened to your concerns and we sought to address them in a responsible manner. Our tests and analysis have given us the confidence we can take the first steps toward initial defensive operations while we continue to prove out our technology and demonstrate missile defense combat utility through a realistic testing regime.

PREPARED STATEMENT

I believe there are tremendous benefits in putting some threat-precedented technology into the field in manageable increments to provide some defense, to learn more about it and gain experience, and improve it over time. Thank you, Mr. Chairman, and I think I will stop there to allow more time for questions.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL RONALD T. KADISH

Good morning, Mr. Chairman, Members of the Committee. It is an honor to appear before you to present the Department of Defense's fiscal year 2004 Missile Defense Program and budget.

In early 2001 we restructured the missile defense program to develop the capability to defend the United States, our allies and friends, and deployed forces against all ranges of missiles in all phases of flight. With the support of Congress, we have made considerable progress in demonstrating key ballistic missile defense (BMD) technologies and system integration. Our testing and analysis give us confidence that hit-to-kill technology works and that we can take the initial steps we are proposing to bolster defenses against short- and medium-range ballistic missiles and introduce a modest defensive capability to defeat a limited long-range threat. Today I will review our progress, discuss why we are confident in our approach, and outline our plans and challenges ahead.

Over the past two years we have conducted several successful intercept tests. We achieved four for five successful long-range, Ground-based Midcourse Defense (GMD) intercept flight tests, demonstrating the hit-to-kill technologies of the Exo-atmospheric Kill Vehicle, critical sensor technologies, and the integration of many geographically dispersed missile defense assets. The failure of the most recent such test (Integrated Flight Test-10) last December resulted from the non-separation of the interceptor and the surrogate booster rocket. This was not a failure of new missile defense technology, but a failure of our quality control processes. We are increasing our already focused quality control efforts. We are taking steps to ensure

this separation problem is not repeated. Furthermore, future GMD tests will no longer use the surrogate booster and instead will use one or both of the boosters currently under development.

We are three for three in our ship-based exo-atmospheric intercept tests. Last year Aegis BMD successfully completed its Aegis Lightweight Exo-Atmospheric Projectile (LEAP) Intercept (ALI) project. Based on these results we accelerated the insertion of the follow-on Aegis BMD capability into the Test Bed. Our third intercept in November 2002 was the first ever intercept of a ballistic missile in the ascent phase of flight.

Patriot Advanced Capability 3 (PAC–3) has made significant strides. Since January 2001, we have had five for seven successful intercepts of ballistic missile targets and have begun fielding the first PAC–3 missiles. We also executed more than a dozen successful test flights of the Airborne Laser (ABL) aircraft, completed significant aircraft modifications, and accomplished successful subsystem testing and full-up ground-tests of the first laser module. While we are in the difficult phase of integrating the components into the ABL, our progress to date has increased our confidence that ABL can eventually be integrated into the BMD system (BMDS).

Mr. Chairman, America's missile defense program is on track. The Missile Defense Agency is doing what we told Congress it would do. We listened to your concerns and have sought to address them in a responsible manner. We have faced significant technical and management challenges, but through aggressive testing we have proven that hit-to-kill technology works. We have demonstrated system integration through complex system testing. These tests, combined with analysis of simulations and exercises, give us confidence that the system can take the first steps toward initial defensive operations while performing as a test bed for further realistic testing and continued spiral development.

The President's fiscal year 2004 budget will allow us to continue this significant progress and is structured to incorporate the recommendations of the Defense Science Board summer study of 2002.

Evolutionary Approach to Missile Defense

The BMD system involves many sensors and interceptors that are integrated and layered to enable engagements against hostile missiles in the boost, midcourse, and terminal phases of flight. Layered defenses can allow multiple shot opportunities across all of the engagement segments and potentially within each one of those segments, greatly enhancing our ability to handle countermeasures and destroy in-flight missiles and their payloads.

As I have explained in past hearings, we are building the missile defense system using an evolutionary acquisition approach, so that the system's capability can be enhanced over time. Our plan continues to be one of incrementally providing the decision makers the ability to field militarily useful capabilities based on their technological readiness, suitability for operational use and threat developments.

Last December the President directed the Department to field an initial set of missile defense capabilities in order to reduce the vulnerabilities of the United States, our troops, and our allies and friends. Given our fielding approach, and given the successful testing we have accomplished to date, I believe we are ready for this. The proposed budget for fiscal year 2004 and across the 2004–2009 Future Years Defense Program (FYDP) supports Research, Development, Test and Evaluation (RDT&E) activities to accomplish that goal. We plan to begin operating modest land and sea defense capabilities in 2004 to provide limited protection of our country as well as our troops and critical assets overseas.

In missile defense, we deal routinely with revolutionary technologies and unprecedented engineering requirements. The program we are currently executing recognizes the unique challenges we face and sets out a disciplined course to develop the BMD system in an evolutionary way. Having spent the last couple of years looking at different missile defense options, we are now narrowing our program activities and focusing on development and fielding of the most promising elements.

Consistent with the approach I have described in previous hearings, we are building and fielding limited, militarily useful capabilities as soon as they can be made available. This approach takes into account known and projected threats and the present state of technology. With a capability-based acquisition approach we put capability into the field, test it, use it, get comfortable with it, and learn what works well and what does not. We have structured Test Bed fielding opportunities to occur in "blocks" every two years to improve what we have fielded as needed. Block 2004 (initial defense capabilities) represents 2004–2005, Block 2006 represents 2006–2007, and so on. These blocks will deliver elements and components that are ready for continued rigorous testing and full integration into the system.

With the President's decision, we now have a basic near-term architecture for a limited system to address a range of missile threats. I want to stress that we have no fixed, long-term architecture. We will evolve and improve the capability of the Block 2004 system over time, so that what we propose to field initially in 2004 and 2005 may evolve to look very different a decade later. The number and type of missile defense assets and their locations and basing arrangements may be expected to change to make the system more integrated and capable.

We have adopted this evolutionary approach because a single acquisition cycle is not responsive to rapid changes in threat and technology and is not structured to deal with surprise. We want to avoid prematurely constraining system design by using the traditional requirements process and waiting up to twenty years or more for a defensive capability that would result from using traditional acquisition rules. In a world marked by increasing ballistic missile activity, our nation, forces, and allies cannot afford to wait that long.

In using this evolutionary approach, we still have the ability to incorporate the discipline and intent of the traditional acquisition process. For example, the warfighting community has been heavily involved from the beginning in the development of system elements and components. We are successfully using a spiral development process to put new technologies into play more quickly than if we were to use the traditional approach. Spiral development requires regular dialogue and active participation between user and developer for delivering a militarily useful set of capabilities. Once we field the initial capability, uniformed personnel will operate the system.

Despite the many uncertainties we face, this approach allows us to be good stewards of the taxpayers' money. The President's recent announcement stands as a good example of this. We are not making an early commitment to large-volume serial production and very large-scale investments. Our fielding commitment will be scaled over time and rise with our confidence that we are on the right development path for this complex, multifaceted system.

Aggressive Research, Development and Test Activities

As we prepare to implement the President's directive, we plan to continue the program's intensive testing activities up to and beyond the 2004–2005 timeframe. We have a single, robust RDT&E program dedicated to the development and demonstration of missile defense technologies and integration concepts. In fact, consistent with our investments over the past two years, the lion's share of the fiscal year 2004 budget request of $7.7 billion for the Missile Defense Agency, roughly $6 billion, will support RDT&E activities that are not directly tied to system fielding. Significant development efforts in fiscal year 2004 include continued work on Theater High Altitude Area Defense (THAAD), ABL, and kinetic energy boost-phase interceptors in the post-Anti-Ballistic Missile (ABM) Treaty environment.

These aggressive RDT&E activities are the basis for proceeding as the President has directed and for continuing development work to build a multi-layered BMD system. We will continue our practice of assessing these activities on a regular basis to see if they can be accelerated or whether they must be truncated or modified in some manner. RDT&E activities occurring in fiscal year 2004 will contribute to Blocks 2004, 2006, 2008 and 2010.

We are still evaluating the impact of our withdrawal from the ABM Treaty. The treaty successfully did what it was intended to do. It severely restricted missile defense development and fielding options. The President's action has made it possible to begin to develop and test aggressively the full range of missile defense technologies and pursue capabilities that make the most sense from the standpoints of technology, operations, and cost.

For example, as a result of the treaty withdrawal, Aegis BMD, the sea-based defense element, began its successful participation in GMD integrated flight tests conducted last October and December. While initially only collecting boost and ascent phase radar data, Aegis BMD has begun engineering efforts to become a full participant in future tests and will eventually provide fire control data to the BMD system.

Our intercept tests against long-range ballistic missiles are very complex, yet since October 1999 we were forced to restrict ourselves to the same intercept flight geometries because of artificial constraints in our current Test Bed and our obligation to remain compliant with the ABM Treaty. Today, in order to test our GMD interceptors, we must launch targets from Vandenberg, AFB in California and interceptors from Kwajalein Atoll in the Pacific Ocean. We are changing that. The Test Bed we are building will introduce flexibility into our test approach and help overcome some basic geographic and geometric limitations by allowing us to test weapons and sensors against ballistic missiles of all ranges along different azimuths and

using different trajectories. For test purposes we will introduce variable target launch and impact points and engagement areas.

Robust, realistic testing is absolutely critical to developing an effective missile defense system. Over the past two years we conducted a total of 55 flight tests and 60 ground tests. Seventeen of these tests were flight-intercept tests. Each test builds our confidence in the BMD system. From our flight-testing, we know that the hit-to-kill approach works. We know our sensors can successfully detect and track the target and that our software algorithms can discriminate between reentry vehicles and basic decoys and debris. We know our battle management system can generate orders that put a kill vehicle in a position to achieve intercept. We will continue to refine and improve the system's performance in all areas. Our test program continues to add to our confidence that the basic technologies are sound and that they will work together to provide the nation an effective BMD system.

Our program and budget will continue to maintain a high tempo of increasingly complex ground- and flight-testing. Over the next two years we are planning another 68 flight tests, 58 ground tests, and maintaining the same pace of intercept tests as before. We do system testing to give us confidence that we have the ability to integrate geographically dispersed missile defense elements and components into an effective system. This does not include the many experiments we conduct routinely, the modeling and simulation activity, and the wargame exercises. Our computer predictions are very valuable in this process and give us a great deal of confidence that we are on the right paths.

We remain committed to our aggressive testing approach, where we mature midcourse, boost, and terminal missile defense components and elements through rigorous testing under increasingly realistic and challenging conditions. When we have adequately demonstrated technologies, decisions can then be made concerning their integration into blocks for fielding. Testing activities remain central to what we do and are well supported within our funding request.

Initial Defense Capabilities

The Congress has already funded plans to put five midcourse interceptors into the test bed in silos at Fort Greely in Alaska, develop Aegis BMD, and test the SM–3 interceptor at the Pacific Missile Range Facility in Hawaii. Other activities are currently underway to improve the missile defense Test Bed by upgrading or developing launch sites (including Vandenberg, AFB), radar sensors, battle management and command and control components, communications terminals and networks, and associated test infrastructure in the United States and the Marshall Islands (including airborne, sea-based, and ground-based data collection assets).

Today we are asking the Congress to appropriate funds that will allow us to add to this Test Bed and make it operational by 2004. These initial defense capabilities, fielded over a two-year period, will include ground-based interceptors to counter long-range threats, sea-based interceptors to defeat short- and medium-range threats, additional PAC–3 units, and early warning and tracking sensors based on land, at sea, in the air, and in space.

Before the President's decision, the fiscal year 2004 President's Budget would have reflected the development of a set of Test Bed capabilities that could have been made operational. Instead of building a Test Bed that might be used operationally, we are fielding an initial defensive capability that we will continue to test. All RDT&E activities will support the initial defense capability, and the system elements and components we field will continue to support RDT&E. Because of the relationship between initial defense capabilities and testing, we are asking that all funding associated with both efforts be under Defense-wide appropriations RDT&E. With the December announcement we have quickened the pace at which we are moving forward, but we have not changed the direction in which we are moving.

We are proposing to do in fiscal year 2004 what we said we were going to do in previous hearings, that is, field tested missile defenses a little at a time using a step approach. The missile defense operations we are proposing are unprecedented, and there still is much to learn. I believe there is tremendous benefit in putting this unprecedented technology into the field, in manageable increments, to provide some defense, to learn more about it, gain experience with it, and improve it over time.

The Israeli Arrow program stands out as an example of how fielding militarily useful capability in block increments and in a timely manner can work and how successful it can be. With only four successful intercept flight tests, Israeli officials declared their first Arrow battery operational on October 17, 2000 and fielded that country's first capability to defeat incoming ballistic missiles launched from nearby states. The Israeli system has been operational for more than two years now, and during that time it has conducted additional intercept and flight tests to enhance the system's performance. Plans are moving forward to augment it even further.

Surrounded by states having an active interest in ballistic missiles, Israel found a way to field a limited defensive capability on an accelerated timeline and at a time when it could not afford to wait for system testing to be completed.

We in the United States, of course, are not strangers to fielding an unprecedented military capability on an accelerated schedule. Our leadership struggled in the early stages of deploying the first reconnaissance satellites and land- and sea-based ballistic missiles. Urgent national security requirements pressed us to deploy capability soon, and through trial and error we did. Despite test failures, the country persevered and made militarily useful capabilities operational. Since that time, we have dramatically improved the capabilities of those first-generation systems. The parallels between these pioneering programs and the missile defense program are clear.

I believe, Mr. Chairman, that we are ready to take this next step in missile defense. Our fielding approach will not only help rationalize the force structure we deploy from the technological and threat standpoints, but also from the standpoint of cost. We do not now have adequate understanding to submit a bill of many tens of billions of dollars for a huge, long-term fixed architecture. We are able, however, to purchase, produce, and field capabilities in small numbers. This approach will allow us to control costs. With a modest investment and increase by the Department of a total of $1.5 billion spread over the fiscal year 2004 and 2005 budgets, we will provide this country with militarily useful capabilities where none exists today.

In short, this $1.5 billion primarily will add a small number of ground-based interceptors as well as more SM–3 interceptors to the test bed capability we are already building. Future fielding decisions, as we have said all along, will be made in the outlying years based on the progress of technology and the evolution of the threat, subject to the annual congressional appropriations process.

Confidence in Initial Defensive Operations

In assessing our level of confidence with the planned initial missile defense capabilities, we have to strike a balance between our desire for perfection in the missile defenses we deploy and our desire to have as soon as possible a defensive capability where none exists today.

Adequate testing is the key to achieving that balance. And while this testing may not fit the mold of classical operational testing that would traditionally take place prior to full-rate production, we do follow a testing discipline that I believe can give us the confidence to say that what we deploy will work as we have said it would under threat circumstances that we believe we might have to face.

I believe that to strike the right balance we must go through an intense period of testing to demonstrate that the technologies on which we are relying can work consistently under conditions that are increasingly stressful and realistic. We have spent the past two years demonstrating the technologies we propose to employ in the Block 2004 Test Bed. We have said all along that when we do field we will not field a system that will fully meet our missile defense needs. We will face limitations and have gaps, let there be no illusions there. The system we are initially fielding will be limited operationally. But we went down this road knowing that there would be gaps and with a process that is specifically designed to fill those gaps and make up for performance limitations as soon as practicable.

Among the limitations that should be included here is that of operational experience. We need to build operational experience over time with the system that will be guarding our nation and our troops. There is no better way to do that then to put basic elements out into the field and to begin working with those assets to develop the doctrine and concepts of operation we will need and to train the military personnel who will operate it.

We have spent significant amounts of money on testing the GMD and Aegis BMD elements of system. All of the tests to date have been what we have called "developmental tests." Regardless of the names we apply to our testing, we must have assets and infrastructure in the field if we are going to begin to test that system under operationally realistic conditions. If we do not have the weapons and sensors fielded at operationally useful locations, we cannot really do a good job of hooking it all up to make sure it works.

The President's decision allows us to put this materiel out in the field for testing, in locations that make sense from an operational point of view. Given the recent events in the international security environment, the President's decision reflects an urgent need to make that test bed as operational as we possibly can. That decision also recognizes that we will not be fielding the perfect system at the outset.

What we are faced with today is a timing issue. Must we do what has been traditionally called "operational testing" before we can say that we have a capability we can use in an extreme security situation, or can we do both? Can we continue to

test the elements and components of a system we also could use to defend ourselves if needed? I believe we can.

Why do I believe that? Because we have shown that the nuts and bolts of the missile defense capabilities we are planning to field in Block 2004 can work. We have had a significant degree of repeatability represented in the tests we have conducted to date, and we are well along in our goal of conducting these tests reliably. We are now to the point where we need to assemble selected missile defense elements into a test bed that will permit operationally realistic testing using different azimuths and trajectories, different launch and target points, and different arrangements in our sensors and weapons. That test bed will allow us to test in different ways so that we can refine our all-too-important battle management and command and control infrastructure. The elements of the test bed also will have some inherent defense capability. We can do operational development testing while having the system on alert. We should take advantage of that.

Our intentions are to test the complete system and to be ready to respond to ballistic missile threats against the United States, our deployed forces, and our friends and allies. We have conducted the rigorous testing needed to give us the confidence that we are far enough along to do operationally realistic testing in an integrated way. Testing will always be an important part of this system—always. We will always be improving what we have in the field. The budget we have submitted will support the testing required to ensure that the elements of the Block 2004 system we would like to field will adequately serve the defense needs of this nation.

Our RDT&E activities are extensive and are important part of our acquisition approach. Below are three areas of special interest.

BMD System Radar Activity

The MDA's Family of Radar concept is continuous and flexible global detection, tracking, discrimination, and hit assessment. Ideally, we want to be able to watch missile payloads deploy and accomplish prompt and early battle assessment. We are currently pursuing multiple sensor technologies and identifying and developing sensors to give the BMD system the "eyes" it will need. In order to identify the most promising technologies and reduce risk, we are investigating, in parallel, sensor alternatives on land-, sea-, air- and space-based platforms to add robustness to the BMD system and improve opportunities to collect multiple phenomenology on the threat missile or target complex. Evaluations of different sensor and weapon combinations and alternatives will help us assess their overall benefit to an integrated, layered BMD system. An important element in this effort is the mobile Sea-Based X-Band radar (SBX), which we plan to build by September 2005 to greatly improve both testing and our initial defense capability.

The BMDS Radar project, a new activity, is funded in the fiscal year 2004 budget to expand the engagement battle space and assess missile defense concepts of operation that we were not allowed to consider under the ABM Treaty. We will validate the concept of forward-basing and sensor layering and evaluate advanced algorithms using both MDA- and non-MDA-owned sensors. Current plans call for the BMDS Radar to be available for integration into the Test Bed in late 2006. We will support continuous sensor research to improve capabilities and develop advanced algorithms for Block 2008 and beyond.

BMD System Infrared Sensor Activities

The Department restructured the Space Based Infrared System-Low (SBIRS Low) element in fiscal year 2002, renaming it the Space Tracking and Surveillance System (STSS). We will explore new technologies to enhance missile detection, improve reporting on ballistic missile launches regardless of range, azimuth, or launch point, and provide critical midcourse tracking and discrimination data.

The Russian-American Observation Satellites (RAMOS) project is a cooperative effort between the United States and the Russian Federation to improve early warning technologies. RAMOS represents an innovative space-based sensor R&D initiative. We are proceeding towards a joint Preliminary Design Review this summer and expect to conclude the design and development phase in early fiscal year 2005. The United States is actively striving to reach a bi-lateral agreement to conduct activities beyond the design and development phase. If we are able to move forward with this project, we would launch two satellites in late fiscal year 2008.

BMD System Interceptor Activity

Our longer-term goal is to develop low-cost enhanced interceptors for integration with different platforms to defend against missiles in the boost, midcourse, and exoatmospheric terminal phases of flight. We are consolidating all next-generation kinetic energy interceptor (booster and kill vehicle) development efforts and placing them under our BMDS Interceptor activity. Relying heavily on existing hardware

and proven technology, we will develop a hit-to-kill boost phase capability by Block 2008 and deliver capability enhancements for Block 2010 and beyond.

In fiscal year 2004 we will begin developing a space-based kinetic energy interceptor Test Bed to explore the technological feasibility and operational advantages of engagements from space. This plan is consistent with the Defense Science Board's recommendation, released last August, to establish a comprehensive development program for a space-based kinetic system. Following up on last year's successful experiments to understand key sensor technologies, we will conduct in 2004 a Near Field Infra-Red Experiment to observe from space a boosting rocket. This data will assist in the selection of seeker and sensor technologies for a ground-based boost interceptor and development of interceptor guidance and homing algorithms.

Block Activities and Budget

We are working within the MDA and with the Department's operational community to meet the President's objective to establish an initial defense capability in 2004, which begins with Block 2004. The following describes by block our planned fielding opportunities across the FYDP.

Block 2004

This block continues development and integration of elements, components, and facilities in the Test Bed. Block 2004 RDT&E funding will deliver capabilities directed by the President for operational use in fiscal year 2004–2005. We plan to add different capabilities to point-defense capabilities already provided by PAC–3 units. This initial fielding will grow the RDT&E program and expand the physical infrastructure of the Test Bed.

Funds in this block will enable us to conduct major target and countermeasure development and capability demonstrations, integration tests, and experiments. We are investing in a substantive system test program to test system command, control, and battle management (C^2BM) and communications across the elements. The Block 2004 Master Test Plan lays out the strategy for conducting a comprehensive set of integrated and distributed ground- and flight-tests to verify performance and characterize the capability of the system. This test program will form the basis of operational and military utility assessments of the Block 2004 initial defense capability.

We will have three major system integration flight tests, the first of which is a large-scale integration event that tests C^2BM and communications during multiple element intercept tests. We plan to demonstrate C^2 capabilities and communications among C^2 and battle management nodes, weapons, and sensors and to continue work with the Services, Combatant Commands, and the Office of the Secretary of Defense to ensure BMD system interoperability with legacy and planned Department systems and standards.

We are requesting $3.2 billion in fiscal year 2004 to support RDT&E for fielding Block 2004. Our estimated expenditure for Block 2004 activities across the FYDP is $6.2 billion (see Table 1).

TABLE 1.—BLOCK 2004 FUNDING FISCAL YEAR 2002–09

($M then-year) [1]

Project	Fiscal year—								FYDP fiscal year 2004–09	Totals fiscal year 2002–09
	2002	2003	2004	2005	2006	2007	2008	2009		
C^2BMC Block 2004	21	80	114	79	.....	.....	.....	.....	194	295
Hercules Block 2004	.....	.....	18	27	.....	.....	.....	.....	46	46
Joint Warfighter Support Block 2004	.....	.....	24	13	.....	.....	.....	.....	37	37
Test & Evaluation Block 2004	47	57	37	33	.....	.....	.....	.....	70	174
Targets & CM Block 2004	75	104	197	170	.....	.....	.....	.....	367	547
THAAD Block 2004	808	888	622	635	65	.....	.....	.....	1,322	3,018
GMD Test Bed Block 2004	636	452	1,205	868	.....	.....	.....	.....	2,073	3,161
Aegis BMD Test Bed Block 2004	413	440	648	894	98	.....	.....	.....	1,640	2,492
ABL Block 2004	454	348	345	150	.....	.....	.....	.....	494	1,296
TOTALS	2,454	2,369	3,212	2,868	163	.....	.....	.....	6,242	11,065

[1] Numbers may not add exactly due to rounding.

Boost Elements.—We are developing directed energy and kinetic energy boost phase intercept capabilities to create a defense layer near the hostile missile's launch point. We require quick reaction times, high confidence decision-making, and redundant engagement capabilities to counter ballistic missiles in this phase.

ABL is currently under development to acquire, track, and kill ballistic missiles in boost phase using speed-of-light technology. ABL integrates three major subsystems (Laser; Beam Control; and Battle Management, Command, Control, Communications, Computers and Intelligence (BM/C^{4}I)) into a modified commercial Boeing 747–400F aircraft. We will continue major subsystem integration and testing activities. Block 2004 activities involve completion of ground-testing, to include first light on the test bed aircraft, first flight of the complete weapons system, and the successful track and high-energy laser engagement of a missile-shaped target board dropped from high-altitude. In fiscal year 2005, we will deliver one aircraft for BMD system integration and testing and demonstrate a missile shoot-down against a boosting threat-representative target.

Midcourse Elements.—Midcourse defense elements engage ballistic missiles in space after booster burnout and before the warhead re-enters the atmosphere. The GMD element defends against long-range ballistic missile attacks, and Aegis BMD will counter from the sea medium- and short-range ballistic missiles.

The Department's plans are to add by the end of fiscal year 2004 one more Ground-Based Interceptor (GBI) at Fort Greely in Alaska for a total of six GBIs at that site, and four interceptors at Vandenberg Air Force Base, for a total of up to 10 interceptors at both sites. The decision to develop two interceptor sites is consistent with our layered approach and operational concept and will allow us to work through critical integration, battle management, and command and control issues early on.

There are a number of other activities we need to undertake in fiscal year 2005. We are asking for appropriations to produce up to ten additional GBIs for fielding at the Fort Greely site, for a total of sixteen interceptors in Alaska and four in California. We also plan to produce by the end of 2005 between ten and twenty SM–3 missiles for deployment on three Aegis ships converted to the missile defense mission. Because we are starting from a base of zero, each interceptor we field between now and 2005, up to the full complement of twenty ground-based and twenty sea-based interceptors, will increase significantly our overall capability to defend this country, our troops, and friendly countries against long- and medium-range threats.

Included in the Test Bed and as part of the initial missile defense architecture are plans for integrating Early Warning Radars (EWR) at Eareckson AS (the Cobra Dane radar at Shemya, Alaska) and Beale AFB (Upgraded EWR). We will add to this infrastructure multiple fire control nodes and improved lines of communications connecting sites in Alaska and the continental United States using fiber optics and satellites. As you know, the Administration is working to secure allied approval to upgrade and integrate into the BMD system early warning radars currently located in the United Kingdom and Thule, Greenland to view threat missiles launched out of the Middle East. The United Kingdom already has approved the use of the Fylingdales radar. We also plan to build by September 30, 2005 a Sea-Based X-Band Radar (SBX) to improve the testing regime and enhance initial missile defense system performance.

We have made dramatic progress in recent months with the GMD element, including in the areas of silo construction, development of a nationwide communications network, and integrated flight-testing. We have excavated six silos at Fort Greely, seven weeks ahead of schedule, and we are in the process of constructing and establishing appropriate security for multiple Test Bed facilities at Fort Greely and Eareckson.

By the end of 2005, we will upgrade SPY–1 radars on fifteen Aegis warships for enhanced surveillance and track capability. Three prototype surveillance and track Aegis destroyers will be available starting in 2003; we will modernize additional destroyers for surveillance and track and BMD engagement capability. Two Aegis cruisers in addition to the USS LAKE ERIE, our test cruiser, will receive BMD engagement modifications.

The next SM–3 flight test, scheduled for later this year, will use a reengineered Monolithic Divert and Attitude Control System (MDACS) for the first time in the interceptor's kinetic warhead. MDACS has proved to be more reliable than the previous model, faster to build, and less expensive. Five at-sea flight tests and numerous tracking exercises, including participation in GMD integrated flight-tests, are planned through 2005. Our cooperative research with Japan will continue to enhance the capabilities of the SM–3 interceptor. The focus of that research is on four components: sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone.

Terminal Elements.—THAAD is designed to be rapidly deployable and protect forward-deployed United States and friendly troops, broadly dispersed assets, population centers, and sites in the United States by engaging short- to medium-range ballistic missiles or their payloads at endo- and exo-atmospheric altitudes. THAAD could have more than one intercept opportunity against a target, a layering potential that makes it more difficult for an adversary to employ countermeasures effectively. This terminal defense capability will help mitigate the effects of a WMD payload.

This year we will complete missile and launcher designs, initiate manufacturing of missile and launcher ground test units, and begin testing the first completed radar antenna. We will continue fabrication of the second radar and building the battle manager and launcher test beds. A total of four exo-atmospheric flight tests at the White Sands Missile Range, New Mexico are planned for fiscal year 2004–05.

PAC–3 provides terminal missile defense capability against short- and medium-range ballistic missiles, anti-radiation missiles, and aircraft with a low radar cross-section employing advanced countermeasures. PAC–3 successfully completed initial operational testing last year, intercepting ballistic missiles, aircraft, and cruise missiles. The tests uncovered problems that we have since corrected in collaboration with the Army. We have completed development of the PAC–3 missile and made C^2BM modifications to enable PAC–3's integration into the BMD system. We will continue to conduct PAC–3 tests this year. Later in Block 2004 we will demonstrate PAC–3's integration with other BMD system elements.

With the support of Congress, the Department already has accelerated PAC–3 missile production and currently has a plan to increase that production rate to 20 missiles per month in 2005. Given current production plans, by the end of 2005 the PAC–3 inventory will stand at 332 missiles.

The Department has transferred PAC–3 procurement and RDT&E funding to the Army, which is reflected in the Army's fiscal year 2004 budget request. The MDA will retain responsibility for defining and testing BMD system interoperability and continue to work with the Army on PAC–3 engineering, development, and testing. The Department realigned the Medium Extended Air Defense System (MEADS) program on March 31, 2003 to the Army.

The Arrow Weapon System, developed jointly by the United States and Israel to counter short- to medium-range ballistic missiles, is operational at two sites in Israel and interoperable with U.S. missile defense elements. We worked with Israel to deploy its first two Arrow batteries, and are currently assisting that country to procure a third battery.

The Arrow System Improvement Program, a spiral development upgrade of the current operational system, includes technical cooperation to improve the performance of the Arrow system and test it at a U.S. test range. The first flight test was conducted successfully on January 5, 2003. We continue to support additional Arrow flight-testing to assess technology developments and overall system performance and to collect data and conduct annual hardware-in-the-loop exercises with Israel to enhance interoperability.

Block 2006

Block 2006 work continues to improve existing capabilities and provide new sensors and interceptors for integration with fielded elements. Our focus will be on evolving and integrating the capability to achieve a more synergistic and layered BMD system. We will continue rigorous system and element flight-test demonstration and validation efforts and use wargames to help develop concepts of operation and operational procedures.

We are requesting $2.2 billion in fiscal year 2004 to support RDT&E for Block 2006. Our estimated expenditure for Block 2006 activities across the FYDP is $11.3 billion (see Table 2).

TABLE 2.—BLOCK 2006 FUNDING FISCAL YEAR 2002–09

($M then-year) [1]

Project	Fiscal year—								FYDP fiscal year 2004–09	Totals fiscal year 2002–09
	2002	2003	2004	2005	2006	2007	2008	2009		
C^2BMC Block 2006	4	27	53	104	116	.....	.....	.....	273	304
Hercules Block 2006	.....	.....	19	18	45	45	.....	.....	127	127
Joint Warfighter Support Block 2006	.....	.....	.....	12	24	12	.....	.....	48	48
Test & Evaluation Block 2006	1	1	2	9	41	39	.....	.....	92	93
Targets & CM Block 2006	1	4	32	110	213	172	.....	.....	526	530
THAAD Block 2006	.....	.....	109	208	598	498	113	.....	1,525	1,525
GMD Block 2006	2,460	2,109	1,605	1,774	1,354	1,235	.....	.....	5,969	10,538
Aegis BMD Block 2006	.....	.....	24	73	377	299	.....	.....	773	773
ABL Block 2006	.....	.....	10	86	150	79	81	55	461	461
BMDS Radars Block 2006	.....	.....	101	145	134	.....	.....	.....	380	380
STSS Block 2006	55	232	276	285	285	204	75	35	1,160	1,447
TOTAL	2,520	2,372	2,232	2,823	3,335	2,583	270	90	11,333	16,225

[1] Numbers may not add exactly due to rounding.

Boost Elements.—We will enhance and test the integration of the ABL aircraft into the BMD system. Candidate enhancements include improvements in BMC^4I, interoperability, pointing and tracking, and target engagement. We will continue evaluation of the ABL test aircraft capability against a range of threats. This aircraft will be available to provide an emergency operational capability except for a maximum of six months during fiscal year 2007 when it may undergo modifications and enhancements.

Midcourse Elements.—We plan to enhance defensive capability and further develop the Test Bed by maturing hardware and software of all GMD interceptor, sensor, and C^2BM components. We will continue our ground- and flight-testing to demonstrate improved weapon and discrimination performance and critical interfaces with external sensors. We also plan to complete the upgrade of the Thule EWR should we get approval from Denmark.

Aegis BMD flight missions will incorporate remote engagements of targets as well as demonstrations against intermediate-range ballistic missile (IRBM) targets. We will continue development of Aegis BMD sensor discrimination capability. Prototype BMD signal processors will be tested aboard Aegis ships with SPY–1 radar modifications. SM–3 missile deliveries will begin in 2004. Our plans are to build an inventory of up to thirty-five SM–3 interceptors by the end of 2006. Also, if directed, we would prepare to field up to twenty additional SM–3 interceptors in 2007. We will proceed with our cooperative BMD research with Japan to enhance the SM–3. We have two joint flight tests of the advanced nosecone planned in the fiscal year 2005–2006 timeframe, and we will continue to look at possibilities for co-development.

Terminal Elements.—The THAAD interceptor begins in the third quarter fiscal year 2006 a series of five flight tests that are scheduled to conclude in first quarter fiscal year 2008. We will improve THAAD's exo-atmospheric and endo-atmospheric endgame discrimination capability against increasingly complex targets.

Sensors.—Current plans call for a new forward-based radar in late 2006 for positioning close to the threat at sea or on land. Enhanced forward-based sensor capabilities and improved sensor netting will enable the BMD system to handle threats posing a more difficult discrimination challenge and provide a launch-on-remote capability. A midcourse radar will be added as part of our layered approach. Additional radar configurations will be procured as necessary to satisfy Block 2006 objectives.

Current plans are to launch two low-earth orbit satellites in fiscal year 2007 to validate space-based sensor concepts for target acquisition, tracking, and discrimination and to provide a space node for the Test Bed. STSS will improve in subsequent blocks to provide data fusion, radar/sensor cueing over-the-horizon, and interceptor handover and fire control. Production alternatives will be evaluated at least annually based upon element performance and integrated BMD system performance.

Block 2008

Block 2008 represents a major step in BMD system evolution. We plan to complete multiple layers of weapons and sensors, based on fixed and mobile platforms, to counter a range of ballistic missiles. This block will include C^2BM components that enable integrated control of all system assets throughout the battlespace. Primary development projects include adding boost phase weapons to the Test Bed, integrating space sensor platforms, and fusing multi-sensor discrimination products. We will integrate capability-based targets and payload suites (to include new and more complex countermeasures) into our system testing to demonstrate effectiveness against evolving threats.

We are requesting $572 million in fiscal year 2004 to support RDT&E for Block 2008. Our estimated expenditure for Block 2008 activities across the FYDP is $16.3 billion (see Table 3).

TABLE 3.—BLOCK 2008 FUNDING FISCAL YEAR 2002–09

($M then-year) [1]

Project	Fiscal year—								FYDP fiscal year 2004–09	Totals fiscal year 2002–09
	2002	2003	2004	2005	2006	2007	2008	2009		
C^2BMC Block 2008	.....	.....	1	12	27	144	145	147	476	476
Hercules Block 2008	.....	.....	19	17	17	17	62	60	192	192
Joint Warfighter Support Block 2008	.....	.....	.....	.....	.....	12	29	31	71	71
Test & Evaluation Block 2008	.....	.....	1	1	4	13	85	87	190	190
Targets & CM Block 2008	.....	.....	.....	57	77	68	239	253	694	694
THAAD Block 2008	.....	.....	.....	.....	237	227	369	300	1,134	1,134
GMD Block 2008	.....	.....	.....	.....	.....	.....	878	877	1,756	1,756
AEGIS BMD Block 2008	.....	.....	.....	116	186	322	470	386	1,481	1,481
ABL Block 2008	11	237	256	402	582	561	366	267	2,435	2,683
BMDS Radars Block 2008	.....	.....	.....	.....	.....	136	102	22	261	261
STSS Blk 2008	.....	.....	.....	.....	.....	82	177	89	348	348
BMDS Interceptor Block 2008	54	100	296	529	1,013	1,562	1,939	1,890	7,229	7,383
TOTAL	65	337	572	1,134	2,145	3,146	4,862	4,409	16,268	16,669

[1] Numbers may not add exactly due to rounding.

Boost Elements.—ABL will integrate new technologies to improve performance and lethality and enhance operational suitability. We will continue development of promising technologies for insertion into Block 2008 and beyond and design and develop a system-level ground-test facility for ABL. We plan to test a second ABL aircraft in the Test Bed during Block 2008.

Plans also are to develop and integrate a mobile ground-based boost phase hit-to-kill capability into the Test Bed for flight-test demonstration. We will initiate a space-based test bed development to determine the feasibility of intercepting missiles from space. Initial on-orbit testing would commence with three to five satellites in Block 2008.

Midcourse Elements.—We will conduct up to three GMD flight-tests annually to demonstrate advanced engineering and pre-planned equipment improvements for the boosters, interceptors, early warning and fire control radars, and C^2BM and communications software builds. We plan to enhance the Aegis Weapons System AN/SPY–1 radar to improve discrimination for engaging both unitary and separating targets. We will assess GMD integration with the BMDS Interceptor and also test the interceptor on board an Aegis warship.

Terminal Elements.—We will complete the development and testing of the THAAD weapon system. We are planning up to eight developmental and operational-type flight tests to stress interceptor, radar, and C^2BM performance in realistic scenarios that include advanced countermeasures.

Sensors.—Our work will build on the initial BMDS Radar configuration and conduct sensor research to improve capabilities and develop advanced algorithms. We will improve Family of Radar coverage, performance, and flexibility and address vulnerability within the context of the overall BMD system global sensor network. STSS operations will continue to be integrated with other BMD elements in the Test Bed and support enhanced C^2BM development initiatives. STSS will demonstrate the ability to acquire, track, and discriminate midcourse objects with space-based infrared sensors.

Block 2010

Work in this block will continue spiral development projects for weapon and sensor improvements and platform integration. C^2BM and communications improvements will enable highly resolved sensor data to be exchanged with all BMD system elements.

We are requesting $24 million in fiscal year 2004 to support RDT&E for Block 2010. Our estimated expenditure for Block 2010 activities across the FYDP is $4.7 billion (see Table 4).

TABLE 4.—BLOCK 2010 FUNDING FISCAL YEAR 2002–09

($M then-year) [1]

Project	Fiscal year—								FYDP fiscal year 2004–09	Totals fiscal year 2002–09
	2002	2003	2004	2005	2006	2007	2008	2009		
AEGIS BMD Block 2010	.....	.....	.....	.....	.....	8	104	145	257	257
STSS Block 2010/2012	179	55	24	44	232	565	750	1,065	2,680	2,914
BMDS Interceptor Block 2010	.....	.....	.....	.....	97	146	585	974	1,803	1,803
TOTAL	179	55	24	44	329	719	1,439	2,184	4,740	4,974

[1] Numbers may not add exactly due to rounding.

Boost Elements.—Block 2010 activities will improve exo-atmospheric BMDS Interceptor performance and enable greater basing mode flexibility, to include possible adaptation to sea-based platforms. We will develop and test an advanced space-based test bed to augment or replace the Block 2008 space-based test bed.

Midcourse Elements.—We will continue flight-testing improved weapon and sensor components and work toward the integration of an advanced BMDS Interceptor. Aegis BMD will incorporate prior block developments into the Navy-developed next-generation, open architecture Combat System.

Terminal Elements.—THAAD will integrate proven technologies to enhance its capability against longer range and faster ballistic missiles without sacrificing existing mobility and performance. Fielding and survivability upgrades also are planned to demonstrate a capability against both IRBM and ICBM threats.

Sensors.—New technologies will be inserted into subsequent STSS blocks to provide precise threat tracking and improved discrimination. We will develop and launch a satellite with improved sensors integrated into the first common satellite bus, and develop and integrate advanced ground station equipment and software. The Block 2010 STSS will deliver a space-based capability to acquire, track and discriminate ballistic missiles based on larger aperture track sensors, increased vehicle lifetime, and increased, near-real-time on-board data processing. The funding also includes launch services for Block 2010 satellites. C^2BM funding focuses on integrating STSS data into the sensor net.

Mission Area Investments

Our Mission Area Investments are investments common to the entire BMD system that enable us to implement over time our block fielding approach. Mission Area Investments maintain core development and testing infrastructure and facilitate the integration of future block capabilities. The President's Budget requests $1.69 billion in fiscal year 2004 for these investments. This program activity accounts for about $11.3 billion, or just over 20 percent of the total funding estimate across the FYDP. Table 5 provides a detailed breakdown of funding for each investment activity.

TABLE 5.—MISSION AREA INVESTMENTS FUNDING FISCAL YEAR 2002–09

($M then-year) [1]

Project	Fiscal year—								FYDP fiscal year 2004–09	Totals fiscal year 2002–09
	2002	2003	2004	2005	2006	2007	2008	2009		
System Engineering	236	397	436	474	501	510	580	578	3,079	3,713
C^2, BM & Communications	16	16	119	125	178	201	204	218	1,045	1,076
Test & Targets	359	332	338	332	328	352	316	333	1,998	2,688
International Programs	211	205	148	215	129	100	89	89	769	1,185
Advanced Concepts	347	176	388	418	363	437	524	534	2,664	3,187
Program Operations	232	170	264	252	283	306	317	333	1,754	2,156
TOTAL	1,400	1,296	1,692	1,817	1,783	1,904	2,029	2,083	11,309	14,005

[1] Numbers may not add exactly due to rounding.

The significant Mission Area Investments are as follows:

System Engineering

The System Engineering activity defines, manages, and integrates the layered BMD system. Capability-based acquisition requires continual assessment of technical and operational alternatives at the component, element, and system levels. Our system engineering process assesses and determines system design and element contributions and the impact of introducing new technologies and operational concepts to ensure properly synthesized system blocks. These activities provide the technical expertise, tools, and facilities to develop the BMD system and maintain an intelligence and research capability to ensure that the system evolves in a way that is responsive to known and anticipated threats.

We are increasing our focus on risks related to producibility, manufacturing, quality, cost, and schedule of the BMD system elements. We dedicate resources to examine the applicability of technology to system needs and transition readiness. Industrial and manufacturing investment strategies for achieving system affordability and facilitating insertion of successive new capabilities are increasingly vital to the program.

Command and Control, Battle Management & Communications (C²BMC)

Our activities related to C²BMC create interoperability among a wide variety of legacy systems and emerging elements over joint and coalition networks. The C²BMC activity will continue development and integration of the C²BM and communications functions for the BMD system. By fielding software development spirals that improve system synergism, integration capability, and interoperability with external systems, this activity expands the inherent C²BM capabilities of fielded terminal, midcourse, and boost defenses. Communications funding will develop and improve BMD system-wide communication links and sensor netting functions to enable enhanced early warning and quicker interceptor response times. The Joint National Integration Center (JNIC) provides a common environment for the BMD elements to conduct experiments, demonstrations, and exercises and is a key-operating C²BM component of the Test Bed.

BMD Tests & Targets

The missile defense program includes significant test and evaluation infrastructure, test execution capabilities, and analytical tools for program-wide use. The Agency conducts risk reduction, developmental, and operational element and component testing as well as tests to collect critical measurements, such as plume signatures. We also have a rigorous measurements test program to collect data in support of design, development, and engineering activities. Measurements from dedicated test events and targets of opportunity enable us to design components, characterize potential countermeasures, test algorithms, undertake lethality and kill assessment, and validate our critical models and simulations.

Investments providing ballistic missile targets, countermeasures, and other payloads support our test objectives. Presentation of the targets and payloads for flight test events involves designing, prototyping, developing, procuring, certifying, and qualifying for testing. In fiscal year 2003 we will establish a single prime contractor to further enhance system level management of targets and countermeasures activities.

In fiscal year 2004 we will continue to resource critical test facilities, launch capabilities, instrumentation, telemetry, communications, and safety systems underpinning our testing regime. With the enhanced realism of the Test Bed, the increasing complexity of our tests, and the escalating tempo of test activity, our investments in this area will emphasize flexibility, standardization, and mobility.

International Programs

The President has underscored the importance of working with other countries to develop missile defenses and provide protection against ballistic missile threats. We are building defensive layers that could potentially involve a variety of locations around the globe and probably involve many other countries. Last summer interagency teams briefed key allies on the international participation framework. Today we are well along in our discussions with several governments regarding their possible participation in the missile defense program and improvements in our industrial relationships.

Advanced Concepts

We have several Science and Technology (S&T) initiatives to increase BMD system firepower and sensor capability and extend the engagement battle space of terminal elements. In fiscal year 2004, we will continue to focus on the Miniature Kill

Vehicle (MKV) project, which could lead to a flight-test in fiscal year 2005. Fiscal year 2004 funding will support investigating Early Detection and Tracking (ELDT) technology, Laser/LADAR technologies for improved tracking, weapon guidance, and imaging, and technologies for a space-based, high-power laser. While our S&T activities are not on a critical path for insertion into the BMD system, each one of them is being considered for their block enhancement value.

Program Operations

Our Program Operations expenses are primarily for government personnel performing management support activities, contractors that assist in performing these activities, and O&M-like costs associated with operations and maintenance at numerous facilities around the country, supplies and equipment, communications and printing, travel and training, and information technology management.

Management and Oversight

The missile defense program uses an acquisition approach tailored to the unprecedented nature of the technology involved in missile defense. We will continue to work very hard to ensure that the program has adequate management and congressional oversight. There is an improved process in place within the Department that preserves management, technical, and financial oversight by cognizant authorities on the Senior Executive Council and the Missile Defense Support Group. Senior warfighters, including the Joint Requirements Oversight Council, have reviewed missile defense objectives and will continue to do so several times a year. Internally we have in place configuration management procedures, and we produce on a regular basis the necessary threat, system, and configuration control documentation to ensure that our activities continue to support our development and fielding objectives. As directed in the 2002 and 2003 Defense Authorization Acts, we have identified cost, schedule, testing, and performance goals and developmental baselines in the President's fiscal year 2004 Budget justification materials and shown clear linkages between the Agency's budget and key performance measures.

Closing

Mr. Chairman, we are on track with our missile defense program. We know that the technology fundamental to the current generation of missile defenses works. We have demonstrated many times over the past two years that we can collide with a warhead and destroy it. We have the confidence to proceed with plans for an initial defense capability. A few years ago, I could not have said this to the American people. Today I can. We will build confidence in the system over time as we invest in the program.

We also recognize that we have much more work to do to improve the BMD system. The architecture we have in 2004 and 2005 will probably be very different a decade later, depending on how our RDT&E efforts proceed. Our objective continues to be one of improving missile defense capability over time. We have made considerable progress in missile defense over the past three years. With the President's direction, and with your approval of our budget request, we will take another important step on that long road before us.

Thank you, Mr. Chairman.

OPENING STATEMENTS

Senator STEVENS. Thank you very much, General.

I apologize to my colleagues. I had some things in the way, and I didn't call on the Senators. Senator Cochran, did you have an opening statement?

Senator COCHRAN. Mr. Chairman, thank you very much. I will be glad to proceed to hear from Mr. Christie. I think they have done a great job with this program, but I appreciate the recognition.

Senator STEVENS. Senator Shelby.

Senator SHELBY. Same with me. I'd rather hear from the witnesses.

OPERATIONAL TESTING

Senator STEVENS. Mr. Christie.

Mr. CHRISTIE. Thank you, Mr. Chairman, and distinguished members of the committee. I also appreciate this opportunity to ap-

pear before you today to discuss operational test issues involved with building a missile defense testbed that may also have some inherent defensive capability.

Let me emphasize up front my strong support for building this testbed as a means of conducting more realistic ballistic missile defense testing. It will provide us with an excellent capability to test the integrated missile defense system against more challenging targets and under more realistic engagement conditions. Designed to accomplish this testing mission, this testbed will have some limited capabilities to defend against an actual threat, depending of course on certain assumptions about intelligence of an imminent attack and the positioning of sensors to acquire, track, and target the threat.

Regardless of what we call this initial collection of equipment, communications, and personnel, the fact remains that we must build this test capability and put it in the field before we can test the system. Additionally, it is prudent to develop operational concepts and to train personnel in concert with the testbed's development so that whatever inherent capability exists in the testing infrastructure, it could be employed to defend the United States in the event of a ballistic missile attack.

I understand and share the concerns raised by several members of Congress with the precedent of fielding operational systems without adequate operational testing. The Missile Defense Agency (MDA) under General Kadish is proceeding with a design and development strategy that is very proactive when it comes to testing. My staff and I are involved on a daily basis with the MDA and the program managers for the various ballistic missile defense system developments. We are reviewing test plans, participating in planning meetings, witnessing tests, providing coordinated advice, and responding in written reports to Congress on the adequacy of these testing programs. I have access to all the information I need to fulfill these responsibilities.

I have completed my assessment of the PAC–3 initial operational test and evaluation and documented the results in a classified beyond low rate initial production report that was provided to the Congress last November. I have also completed my annual assessment of the overall MDA testing programs and submitted that report to the appropriate committee of this Congress.

In that report I do conclude that the ground-based midcourse defense (GMD) element of the Ballistic Missile Defense System (BMDS) has yet to demonstrate operational capability. This conclusion is based on the fact that many essential components of the GMD element have yet to be built. We cannot test the GMD element without these critical components and we cannot test it realistically without the testbed.

This was illustrated recently when the exoatmospheric kill vehicle failed to separate from the booster in Integrated Flight Test 10. MDA subsequently restructured the flight test program, eliminating further testing with the old booster system. This decision considered the poor performance of the surrogate booster system, and the risks of diverting booster developers from the objective booster design effort, compared with the advantages of gathering additional data from those flight tests.

Beginning later this year and prior to the 2004 decision, testing will resume with two flight tests for each of the candidate boosters and a risk reduction flight for a target launched from Kodiak in Alaska. Intercept testing will continue in IFTs–14 and 15, using a new booster motor. This is followed by integrated ground testing of the testbed and culminates in a system test readiness review.

Current plans call for three more intercept flights for the Aegis Ballistic Missile Defense system prior to the end of fiscal year 2004; the first two intercepts against a non-separating target and the last flight conducted against a separating target. Additional flight testing beyond this point is still in the planning stage. The purpose of the testbed is to establish and define a baseline capability to realistically integrate and test components of the BMDS, and to enhance capability incrementally through block development.

The real challenge is to develop an operational concept for using this testbed that integrates components of the BMDS as they become available in order to evaluate the operational capability of the system and to defend against a ballistic missile attack, if needed. If we don't develop an operational concept and an attack does come, then we will have failed in a most serious way. On the other hand, if an effort to refine an operational concept for an interim system significantly distracts from building the objective system in an expeditious fashion, then we risk similar failure against more sophisticated threats down the road.

While the testbed is a research and development system, this does not preclude us from addressing operational test and evaluation. In fact, it is common for systems in development to combine developmental and operational test objectives. The testbed, including missiles, will provide us an early opportunity to acquire valuable ground test data on intra- and interoperability between the command and control center and the silo/missile complex; on the system and missile health and status built in testing capability; and on system safety, reliability, maintainability, and logistics supportability. Availability of this data will permit lessons learned from the testbed to be considered in improving the objective GMD.

Every major GMD ground and flight test, both prior to and after the 2004 testbed is available, formally addresses both developmental testing and operational testing objectives, consistent with the maturity level of the system. The Service Operational Test Agencies personnel are dedicated to planning the details of the operational test portions of these ground and flight tests, and analyzing and reporting relevant operational test data. My staff is working with these agencies to define independent operational plans for the operational test activities. I will review and approve these operation test and evaluation plans and their associated data requirement. I will use both developmental and operational test data as the basis for my operational assessment in advising General Kadish and the Defense Acquisition Executive. This assessment will also be the basis for my annual report to the Congress.

Mr. Chairman, ladies and gentlemen, my staff has worked diligently with the MDA staff to build what I feel is a very effective relationship. I will continue to work closely with General Kadish to ensure that the mission of the testbed, as a testbed, is kept in per-

spective. I will continue to monitor planning and testing activities to ensure that we test as realistically and as thoroughly as we can, advise the Director, MDA of operational testing concerns, and report my assessments of progress to the Secretary and to you.

This concludes my opening remarks and I welcome your questions.

[The statement follows:]

PREPARED STATEMENT OF THOMAS P. CHRISTIE

Mr. Chairman, Senator Inouye and distinguished members of the committee, I appreciate this opportunity to appear before you today and discuss operational test issues involved with building a missile defense testbed that may also have some limited inherent defensive capability. Let me emphasize up front that I strongly support building this testbed as a means of conducting more realistic ballistic missile defense testing. It will provide us with an excellent capability to test the integrated Ballistic Missile Defense System (BMDS) against more challenging targets under more realistic engagement conditions. Designed to accomplish this testing mission, this testbed will have some limited capability to defend against an actual threat, depending, of course, on certain assumptions about intelligence of an imminent attack and the positioning of sensors to acquire, track, and target the threat.

Regardless of what we call this initial collection of equipment, communications, and personnel, the fact remains that we must build this test capability and put it in the field before we can test the system. Additionally, it is prudent to develop operational concepts and train personnel in concert with the testbed's development, so that whatever inherent capability exists in the testing infrastructure could be employed to defend the United States in the event of a ballistic missile attack.

I understand and share the concerns raised by members of Congress with the precedent of fielding operational systems without adequate operational testing. Let me take a moment here to discuss my assessment of this situation.

The Missile Defense Agency under General Kadish is proceeding with a design and development strategy that is very proactive when it comes to testing. My staff and I are involved on a daily basis with the Missile Defense Agency and the program managers for the Ballistic Missile Defense System elements. We are reviewing test plans, participating in planning meetings, witnessing tests, providing coordinated advice, and responding in written reports to Congress on the adequacy of the testing programs. I have access to all the information I need to fulfill these responsibilities.

I have completed my assessment of the PAC–3 Initial Operational Test and Evaluation test results, which is documented in a classified Beyond Low Rate Initial Production report, provided last November to the Congress. I have also completed my annual assessment of the MDA testing programs and submitted the report to the appropriate committees of the Congress. In that report, I conclude that the Ground-based Midcourse Defense element of the BMDS in essence has not yet demonstrated operational capability. This conclusion is based on the fact that many essential components of the GMD element have not yet been built. We cannot test the system without these critical components, and we cannot test it realistically without the testbed.

This was illustrated recently, when the exoatmospheric kill vehicle (EKV) failed to separate from the booster in Integrated Flight Test-10 or IFT–10. MDA subsequently restructured the flight test program, eliminating further testing with the old booster system. This decision considered the poor performance of the surrogate booster system and the risks of diverting booster developers from the objective booster design effort, compared with the advantages of gathering additional data from those flight tests.

Beginning later this fiscal year and prior to the 2004 decision, testing will resume with two test flights for each of the candidate boosters and a risk reduction flight for a target launched from the Kodiak target launch site in Alaska. Intercept testing will continue in IFTs–14 and 15, using the new booster. This is followed by integration ground testing of the testbed and culminates in a system test readiness review.

Current plans also call for three more intercept flights for the Aegis Ballistic Missile Defense system prior to the end of fiscal year 2004, with the last flight conducted against a separating threat target. Additional flight testing beyond this point is still in the planning stage. The purpose of the testbed is to establish and define a baseline capability, to realistically integrate and test the components of the BMDS, and to enhance capability incrementally, through block development.

The real challenge is to develop an operational concept for using the testbed that integrates components of the BMDS as they become available, in order to evaluate the operational capability of the system and defend against a ballistic missile attack if so needed. If we don't develop an operational concept and an attack does come, then we will have failed in a most serious way. On the other hand, if an effort to refine an operational concept for an interim system significantly distracts us from building the objective system in an expeditious fashion, then we risk similar failure against more sophisticated threats down the road.

While the testbed is a research and development system, this does not preclude us from addressing operational test and evaluation issues. In fact, it is common for systems in development to combine developmental and operational test objectives. The testbed, including missiles, will provide an early opportunity to acquire valuable ground test data on intra- and interoperability between the command and control center and the silo/missile complex; on the system and missile health and status or built in testing capability; and on system safety, reliability, maintainability, and logistics supportability. Availability of this data will permit lessons learned from the testbed to be considered in improving the objective Ground-based Midcourse Defense system.

Every major GMD ground and flight test, both prior to and after the 2004 testbed is available, formally addresses both developmental testing and Operational Testing objectives, consistent with the maturity level of the system. The Service Operational Test Agencies personnel are dedicated to planning the details of the operational test portions of the ground and flight tests, and analyzing and reporting relevant operational test data. My staff is working with the Operational Test Agencies to define independent evaluation plans for the operational test activities. I will review and approve these Operational Test and Evaluation plans and their associated data requirements. I will use both developmental and operational test data as the basis for my operational assessment, in advising General Kadish and the Defense Acquisition Executive. This assessment will be the basis for my annual report to the Congress.

Mr. Chairman, Ladies and Gentlemen, my staff has worked diligently with the MDA staff to build what I feel is a very effective relationship. I will continue to work closely with General Kadish to ensure that the mission of the testbed, as a testbed, is kept in perspective. I am working with the Service Operational Test Agencies to identify data requirements for an operational evaluation plan that I will review and approve. I will continue to monitor planning and testing activities to ensure that we test as realistically and thoroughly as we can, advise the Director, MDA of operational testing concerns, and report my assessments of progress to the Secretary and to you.

This concludes my opening remarks and I welcome your questions.

Senator STEVENS. Thank you very much, Mr. Christie. Senator Cochran.

Senator COCHRAN. Mr. Chairman, thank you very much.

I first want to congratulate both of you, General Kadish and Mr. Christie, for a very workman-like and outstanding performance in the duties that you have. This is a very challenging task that we have given to you, but I think you have demonstrated an ability to use the resources that you have been given by the Congress and to develop tests and field some very impressive missile defense systems. I think the comprehensive approach is the right approach, for long-range ballistic missile defense to shorter-range tactical challenges that we face, and most recently in Iraq.

I would like, building on the experience we have had in Iraq, to ask you what your assessment is of the missile systems that we utilize to protect our troops and population centers in the recent conflict. Could you tell us specific observations that you have about the efficacy of the PAC group for example, and other systems that we may have used?

General KADISH. Let me start first, Senator Cochran, and give you some insight from where we sit on the Patriot as a system and Patriot-3 in particular, and Mr. Christie can add to it.

PATRIOT SYSTEM PERFORMANCE

As you would expect, a lot of the data that I would like to talk about is classified, so I will keep it in the unclassified range. But I guess when you look at the performance right now of Patriot as a system, which includes earlier versions of Patriot as well as Patriot-3, I would characterize the overall performance as very encouraging. And the reason I say it that way is that I think it is probably more proper for us to discuss this when the war is over and we have the chance to look in detail at all the engagements of Patriot and Patriot-3 that occurred during the war.

Now having said that, I would like to talk about some of the things that we really know about the engagements and some of the things that we think we know about the engagements.

What we know about the engagements is that from a ballistic missile standpoint, we have engaged I think nine ballistic missiles of short range character. In addition, what we know is we have engaged those nine targets with a combination of Patriot-2s and 3s. And the final thing we know is that they didn't hit their targets for one reason or another. There were some shots that we let go because they did not threaten any particular defended area, but overall, the performance is very encouraging from that standpoint that we seem to have engaged the targets successfully.

Now what we think we know enters into a lot of speculation because of the data gathering from the war and those kinds of things we have ongoing, and it is probably better to wait until the end of the war and we will have some more information coming in to make definitive statements about it.

But from every indication I have seen and from the data available, we have a pretty good combination and capability against these missiles, and effectively it provides a national missile defense capability, if you will, for Kuwait and so forth.

In addition to that, I think you know that the Israeli system, the Arrow is working in combination with their own Patriot-2s and are in country on that side. So overall, the performance of Patriot, and particularly Patriot-3, which has had two specific engagements against BDMs, has been very very good and as expected, but there is a lot of data we have to gather to make sure that we can stand behind those statements based on the battlefield type of information we're getting.

But it is a major first step and kind of a microcosm of what we are trying to do in missile defense, because I can conclude now that if this data proves out to be as I expect, that hit-to-kill works in combat conditions, at least against short range missiles.

Senator COCHRAN. Mr. Christie, do you have any comments?

Mr. CHRISTIE. I would add a couple thoughts to that. You have received my classified report of last fall which pointed out some problems that we experienced in the initial operational testing. I am heartened that it appears some of the more serious problems encountered in the operational testing had been addressed and fixed by the Army before the deployment. While we cannot get into the classified aspects of Patriot Performance, it appears to have worked quite well.

My other comment is that I am concerned about the fratricide incidents, and of course they are under investigation. We don't know at this point in time whether we can blame them on Patriot or blame them on problems with the aircraft that were engaged.

I support General Kadish's statements otherwise.

U.S. NAVY INTEGRATION IN MISSILE DEFENSE

Senator COCHRAN. The other day we had before the committee the Chief of Naval Operations (CNO), Vern Clark, and he made some comments about the Navy's capabilities that they were testing and developing, that he said offered promise for I think a mid-range defense surveillance system based on cruisers. Tell me what your assessment is now of our capabilities and the promise that we may be able to utilize the Navy in that way. Are you encouraged by the progress of testing programs or do you have plans for more aggressive testing in this area to prove these systems?

General KADISH. Yes, Senator. The Aegis system itself is part of the testbed that we're talking about here, and the early fielding of equipment. We are very encouraged by the SM–3 successes, which is a component of that system now. We were three for three and planning more tests this year and next before we actually start building more of these early missiles.

In addition to that, I will just point out again that in the Gulf area, the U.S.S. *Higgins* has been providing early warning cues to the Patriot system for these engagements, which is again, the type of integration that we want to see between the systems and among the systems to make them work better.

So, I am very encouraged with the Aegis BMD program and the Navy is working very well with us to handle the operations impact of having surveillance capability as well as potentially a defense against medium range missiles in the 2004 time frame, very big steps forward in that regard.

Senator COCHRAN. I'm only going to ask one more question and then yield to others.

MISSILE DEFENSE TESTBED

The fact that you have made a decision to use the testbed in Alaska as a deployed system in fact that would provide our Nation some defense or a defense capability against ballistic missiles is encouraging to me, and I applaud you for it, and I want you to know you have supporters in that decision. And I wonder, when do you think you will be able to have the first test of that testbed, what is the timetable?

General KADISH. I think we're still nailing down some of the details, but I think it will be in the first quarter of calendar year 2005 is when we're planning the first integrated test of the testbed with an intercept test. Prior to that time we will be doing an awful lot of ground testing, integration testing on all the equipment across the board. So if I'm not mistaken, I think that's the target time frame.

Mr. CHRISTIE. In particular, we will be using different geometries, firing the target from Kodiak with an intercept or launching from Vandenberg. That would be the first time we have gotten away from the relatively unrealistic geometries used in testing to

date with the interceptors out of Kwajalein and the targets from Vandenberg.

General KADISH. The plan currently includes, and we're still debating this internally, two to three tests a year out of the testbed configuration involving intercepts, and many more ground tests involved. And we are even starting the planning to do multiple systems integration, where we will try to do a test against a long-range missile and at the same time will try to intercept a medium-range missile with Aegis and other types of systems. So that planning is ongoing and we haven't nailed all those things down because this is new and quite complicated, but that's the direction we're going.

Senator COCHRAN. Thank you, Mr. Chairman.

Senator STEVENS. Senator Shelby.

MINIATURE KILL VEHICLE (MKV)

Senator SHELBY. General, would you tell us what you can about where the development of the miniature kill vehicle, the MKV program currently is, and what improvements your 2004 budget request will allow you to make in this program? And just say what you can. I understand where we are.

General KADISH. The miniature kill vehicle advanced development is ongoing. We have an acquisition strategy to put contractors on contract to actually build these vehicles and start testing them. And I am very encouraged by the whole process. In fact, we're looking even closer at how we can do that better than where we started because of what we found out over the past year.

And the budget request supports that effort in the overall process, and we're looking cautiously optimistic about having that added to the architecture in the latter part of the decade, if we have the success that we expect.

STRATEGIC MISSILE DEFENSE COMMAND

Senator SHELBY. What about the role of the SMDC and the Technical Center is playing in this? They are right in the center of this, are they not?

General KADISH. That's right. The SMDC and the folks surrounding that, particularly in the Huntsville area, have been the key to a lot of our successes. In fact when I look across the board, we have an awful lot of people counting on us across the country, particularly in places like Huntsville and others at SMDC, to make it successful. And we only have about 550 some odd days before we want to actually declare the testbed in operational capability, and everyone is working hard to make that work.

Senator SHELBY. General, do you feel pretty confident that the mission of the MKV is on track to meet your flight experience test goal in 2005.

General KADISH. I do, Senator. It's not going to be easy.

Senator SHELBY. Like Senator Cochran says, it's a real challenge but, you have been meeting those challenges.

General KADISH. We have, and I'm confident in our planning and the management approach that we're taking, it all comes down to people in the end, and we have some good people.

Senator SHELBY. General, I fully support the President's plan to field initial BMD capabilities in 2004. Establishing the testbed is a critical step for the ground-based missile defense strategy. This initial BMD strategy will set the stage as we have been talking about, for a more robust and realistic testing of ground integration of the future layered ballistic missile defense capability. I expect there's enormous complexity to this program, more than complex, I guess, and want you to succeed.

GROUND BASED MID-COURSE DEFENSE

But some of us are concerned about the health of the ground-based midcourse defense segment. I am concerned that the GMD segment has been used to cover other funding requirements within the MDA, to the extent that near-term objectives are threatened. Is the GMD segment currently facing a budget shortfall and if so, how large?

General KADISH. Well, Senator, we always have more requirements than we do funding. So starting from that premise, as I look at the GMD budget, we have increased the budget over our last year's request in the 2004 column by about $400 million. We have added some tasks to make the operational testbed portion of this, and I would say that overall in every program, we rebalanced and reallocated, and it was somewhere around $400 million to $800 million that had to be readjusted, but there is a net increase to the overall budget in GMD. And it's a matter of prioritizing the tasks to be done, and at this point in time, I believe our request is adequate for what we have set out to do. However, just like any other program, if we run into problems and we have issues that we have to use money, we're going to have to make some tough decisions in the overall process.

Senator SHELBY. Do you believe that you will be able to meet your deployment testing and development objectives of GMD?

General KADISH. I believe we can under the current framework, and I will be the first to let you know if we run short.

Senator SHELBY. Yes, sir, let this committee know.

General KADISH. Yes, sir.

MDA NATIONAL TEAM

Senator SHELBY. Lastly, we are concerned about the impact of the National Team. Is it fair to say that the National Team is central to the MDA's ability to accomplish its mission?

General KADISH. I believe it is, and we have been—there is some misunderstanding about what I mean by the National Team. What I mean by the National Team is it includes government, contractors, industry members across MDA to pull together and do the hard engineering among and between the systems. And quite frankly, I don't know how to get the technical job done without that kind of effort.

And we have been 14 or 15 months into it. I would like it to be a little further downstream in terms of our ability to solve some of the problems.

Senator SHELBY. Is that your major concern?

General KADISH. I think so, it's a major concern, but you know, from a realistic standpoint, I think we're doing about as good as

we possibly could do at this point in the process. And by this time next year, I think we will be much better off than we are today in that regard.

Senator SHELBY. General, we appreciate the job you're doing and the leadership that you have shown. Thank you, Mr. Chairman.

Senator STEVENS. Senator Inouye.

Senator INOUYE. Thank you very much. I regret that I was late, Mr. Chairman, and I request that my statement be made part of the record.

Senator STEVENS. It will be.

[The statement follows:]

PREPARED STATEMENT OF SENATOR DANIEL K. INOUYE

Today I am pleased to join our Chairman in welcoming to the committee Lieutenant General Ronald T. Kadish, Director of the Missile Defense Agency and Mr. Thomas Christie, Director of Operational Test and Evaluation.

Missile defense is, of course, a program of great interest to many, and one not without controversy. Indeed, the missile defense program is one of the most critical national security issues of today and for the foreseeable future.

There is no question that the ballistic missile threat against our nation and our troops in the field will continue to grow as technologies to develop and acquire ballistic missiles continues to proliferate.

The question our country faces is how best to meet this threat. The administration's plan calls for a "layered" defense to intercept ballistic missiles of all ranges, and in all phases of flight to defend the United States, our allies and friends, and our deployed forces around the world.

This is an expensive program. The fiscal year 2004 budget request includes over $7.7 billion for the Missile Defense Agency. It is also a complex program. Despite successes in recent tests—and for that I commend you both—there are still many technological hurdles to overcome.

Let me assure you, General Kadish, this committee views the missile defense program as critically important to our national security. And we will do our best to support your efforts. Nevertheless, given the risks and costs of this program we will remain ever vigilant in our oversight.

Today's hearing provides the committee an important opportunity to understand the Department's fiscal year 2004 budget request and the priorities and challenges of the missile defense program.

Gentlemen, we welcome your testimony.

AIRBORNE LASER (ABL)

Senator INOUYE. General, can you give us an update to the status of the airborne laser, its cost, its schedule, the so-called weight increase, and why the funds were less for 2004 than this year?

General KADISH. Senator, the overall situation in the ABL is that I guess I would characterize it is we are cautiously optimistic about our ability to execute the ABL effort. We have about 18 percent of the effort left to go if you measure it in terms of the cost versus the tasks that we think we have to do. So, about 80 percent done or thereabouts, with the toughest 18 percent to go.

From a cost standpoint, I believe we have enough budget to handle the program as we currently understand it. We are heading towards a shoot-down of a ballistic missile sometime in the 18 to 20 month timeframe ahead of us. We're working that schedule hard every day because when, if you look at Edwards Air Force Base where we have all the hardware coming together, it's all out there and we're putting it in the ground, and the system that we have there in the carcass of a 747.

One of the things I'm looking forward to right now this year is something we call "first light". That is, when we get the laser to

work in the ground-based configuration that we have, and then we're going to put it in the airplane and do it in the air, prior to shoot-down. If we accomplish that first light this year, my confidence in meeting our scheduled goal of 18 to 24 months or thereabouts to do the shoot-down will go up tremendously.

So that's what I'm looking for next, and we're having some technical issues meeting those schedules, but I think on balance we're doing pretty good given the technology.

There's this issue that kind of surrounds the program about the weight of the laser modules in the airplane. Now certainly, I would invite the committee members to go out to Edwards to see this technical marvel, in my opinion. If you look in the back of that 747, you can imagine how big the back of this cargo airplane is. We fill up that cargo airplane with a lot of plumbing and a lot of exotic material, and things that produce this laser and the beam surrounding it.

The weight issue gets down to how heavy all this equipment is for the overall airplane, and the fact that some of it is in a certain part of the airplane. And you can overgross a part of an airplane in terms of its floor weighting and that type of thing, but not affect the overall weight of the airplane and how it flies. So it's a complex interaction but the way I would say it is, the weight issue is really not a problem with the lasers, from my opinion. We know what it is.

What it affects is how long it flies; instead of 4 hours it may be 3½ hours before refueling. And we know that it meets the individual weight requirement for where we put it in the airplane. So it's pretty heavy for the spot we put it in, but it's still okay for the overall weight. Now what it means for the long-term health of ABL is whether or not we can make the airplane stay airborne longer from the overall operational context, and certainly that will be desirable. But my main goal right now, along with the many hundreds of people working that program, is to make the laser work and shoot down a missile with it, and the weight issue is not preventing us from doing that and in fact is not something that we're worried about too much for this configuration, it will be for later.

The budget request for fiscal year 2004, I think is a little bit less than what we asked for last year, but that reflects the fact that we want to be finished with this particular part of the program in the fiscal year 2004 time frame.

Now we're going to have to look at our performance on the airplane to see whether or not we're actually going to finish on time. As I said, we still have some uncertainty between 18 to 24 months, or when exactly that shoot-down is going to occur. But to sum it all up, I am cautiously optimistic.

The cost issue, we potentially could overrun somewhere between 15 to 20 percent on the program. We have enough budget to cover the program effort and we are right on the edge of making this very revolutionary technology to prove itself or fail, and we just don't know the answer to that question, yet.

Senator INOUYE. So we should not be too concerned about your reduction in the request?

General KADISH. At least not right now, Senator. It's kind of like I was telling Senator Shelby about the ground based. It will depend

on how well we can execute this year's budget for ABL, and I think we have enough money now.

NAVY INTEGRATING, AEGIS

Senator INOUYE. What is your arrangement with the Navy on the Aegis system? There's a cruiser under your command isn't there?

General KADISH. That's right. We needed to have a dedicated vessel to do a lot of our testing for Aegis and in talking with the Navy senior leadership, particularly the CNO, Admiral Clark, we came to an arrangement where the Navy will actually give us a cruiser to use for full-time testing. And they are also working, having operational ships doing the mission for the testbed that we described earlier. So we have been making pretty good progress and we have the assets now, and we can do the job.

Senator INOUYE. So you would say you are pleased with the agreement so far?

General KADISH. Yes, sir, very pleased.

Senator INOUYE. Thank you very much. Thank you, Mr. Chairman.

LASER FUNDING

Senator STEVENS. Thank you, Senator.

General, I'm a little concerned about the reduction in laser money funding too. Is there any real reason for that in terms of, was that your decision or was that a decision of others?

General KADISH. Well, Senator, that was done internally at MDA and we basically made the allocation decisions I guess over the past 6 or 8 months, and that's what you're seeing in the final budget release. But as I said earlier, the time difference between when we put the budget together and the execution of the program may yield a different answer, but right now I believe we have enough dollars to do the job. I could get back with you later, both you and Senator Inouye, with details of that for the record, and talk to you about it.

[The information follows:]

AIRBORNE LASER

We were able to rephase ABL's fiscal year 2004 and fiscal year 2005 funding between the submittals of PB03 and PB04. The fiscal year 2004 reduction from $830 million to $610 million is due primarily to the "just in time" payment schedule of the "Green aircraft" in fiscal year 2005 and stretching of the iron bird funding and a better definition of the Block 2004 requirements.

MDA TESTBED, FORT GREELY

Senator STEVENS. Is your Initial Operational Capability (IOC) for Fort Greely still the same?

General KADISH. It is.

Senator STEVENS. For 2004 or 2005?

General KADISH. We're heading—I have to be more precise in order to manage the program and set goals, so our precise date is September 30, 2004. Now recognize that date could move depending on the problems we deal with in execution, but we are driving the schedules to that date on balance.

Senator STEVENS. And how many interceptors does that call for at Fort Greely?

General KADISH. That's up to 10 interceptors.

Senator STEVENS. Will there be any interceptors at Kodiak?

General KADISH. No, sir.

Senator STEVENS. Will there be any at Vandenberg?

General KADISH. There will be four at Vandenberg and six at Fort Greely, and then the next year we add 10 to Fort Greely.

AIRBORNE LASER

Senator STEVENS. Back to the laser. Do you have a schedule for that in terms of what its IOC is?

General KADISH. I guess the way, the sort of short answer is no right now, because we have to actually do the demonstration and the test before we can be confident on when we can actually build more of those systems. But another way to look at it is that once we have the shoot-down with the airplane that we have today, we will have a basic capability in that airplane if it's needed for other reasons, just like we do with the ground-based testbed.

So, a prerequisite for me to answer that question with some certainty is when we actually demonstrate the capability to shoot down a missile with high energy laser from that airplane, we could make a decision on whether or not we should proceed or how we should proceed to build more of those systems. That planning is ongoing now but we haven't nailed down a date. I would assert that it would be as soon as practical if it's successful, because it's such a big addition to the overall architecture.

BOOST VEHICLE TESTING

Senator STEVENS. Our staff tells me that the Director of Operational Test & Evaluation (DOT&E) fiscal year 2002 Annual Report indicates that testing of boost vehicles thus far has been limited to relatively low velocity intercepts, which tests only a small portion of the threat engagement space. What's your comment on that? Why is that?

General KADISH. That's true. This gets back to having the test geometry that flies our targets out of Vandenberg and intercepts the interceptors out of Kwajalein. Two years ago we didn't know whether hit-to-kill could actually work, so what we were trying to do with that basic test geometry is to show that it not only can work but it can repeatedly do it in the same geometry. We have proven that.

So it is true that the overall envelope, if you will, all the different points that we could actually possibly intercept an incoming missile, has not been tested. But the key element of whether or not we could do it at all and do it reliably has been tested in a very small part of that envelope. Now we have models and simulations that tell us that all the other parts of the envelope, even with that limited amount of testing, we could be confident to some degree that this thing would work if it was in the right place and deployed configuration.

So I think this is a natural progression, and that is why we need the testbed, so that we could take different geometries and plot them within the overall envelope, and then we would have more

confidence in our computer models and simulations, even more than we do today, that it's accurate with real data.

So, we started out very legitimately with what we are testing today, and that provides us some data but it's directed to a very limited part of the envelope. Now we want to build a testbed and over the next few years fill out the rest of it, and that will give us more confidence in our operational capabilities.

PATRIOT FRIENDLY FIRE INCIDENTS

Senator STEVENS. Turning to Patriot, there have been two instances in Iraq where the Patriot has really locked on to friendly force equipment. It was explained to us that that was the result of a failure of the use of proper Identification, Friend or Foe (IFF) codes. Is that true?

General KADISH. Well, certainly that might be a contributor, but I just don't think we know yet based on all the things that we need to have from the investigation of that problem. Now certainly what we call combat identification, which these IFF codes help us with, has been a problem for friendly fire incidents for a long time, and any system like this has to deal with it. But I don't think we can definitively answer that question until we get the investigation over with and we get the ops tempo of the war to the point where we can do even more investigation on it.

Senator STEVENS. Have we ever tested the Patriot-3 against Scuds?

General KADISH. Yes, Senator, we have, and Scud-type materials, and we have a pretty good characterization of what we think Patriot-3 can do against those types of threats. Going beyond that, I would prefer to give you more classified information on that.

PATRIOT TESTING/PERFORMANCE

Senator STEVENS. I'm just interested in whether we have really explored the full capability and envelope on what the Patriot should be relied upon and whether there is a gap there in terms of our basic missile defense system.

General KADISH. I would say that with the testing we've done, we have anchored the models and simulations. I think maybe Mr. Christie could add some comments to this, but we have a pretty good analytical capability anchored in actual test data on the capabilities of Patriot-3.

Senator STEVENS. Mr. Christie?

Mr. CHRISTIE. As I stated earlier, we forwarded a classified report to Congress last November which is explicit as far as the PAC–3 system's demonstrated capabilities and against the various threat targets, that we feel confident about.

Senator STEVENS. I'm not familiar with that report. Did you give it to the Armed Services Committee?

Mr. CHRISTIE. That was a report sent to Congress in November 2002, and we can certainly make sure that you get a copy.

The report was based on the testing that was done prior to that time, the initial operational testing for PAC–3. PAC–2 was used during those tests also. As I stated earlier, problems that we encountered in testing, the Army took action to clear up. Without get-

ting into detail, I would recommend that you take a look at the classified report.

SEA BASED X-BAND RADAR

Senator STEVENS. I will. Those are PAC–3s that are over there now, right?

Mr. CHRISTIE. Yes. I think we have fired four.

General KADISH. We have fired four PAC–3s, but most of the engagements have involved the PAC–2 version in the blast fragmentation activities, so it's an integrated system, and they've used it to good advantage. One of the reasons we're not using only PAC–3s in my view is that we just don't have enough of them in the initial production, and I think the PAC–2 is handling it.

Senator STEVENS. You know, I feel a little responsible for that to a certain extent, given that we asked the question of why it should be used solely against an incoming vehicle, I remember that, but we asked the military to boot it up to a PAC–2 level and now this PAC–3 level.

But I really don't totally understand the problem of interception with a combat identification or IFF concept. Maybe we ought to talk about that in classified session.

General KADISH. I think that would be helpful.

Senator STEVENS. Why don't we do that, and I want to ask is whether that's a defect in the system or a defect in the application of the system.

General KADISH. I think it may be both, it could possibly be both.

Mr. CHRISTIE. There are investigations underway into each of the three incidents. I think we should wait until they are complete before we begin jumping to conclusions as to where the fault lies.

Senator STEVENS. You talked before about this in terms of the sea-based X-band radar concept. Where does that stand now and where is the platform?

General KADISH. The sea-based approach is ongoing and they are doing the engineering and naval architecture and everything they need to do to build that radar. I believe the platform is about ready to be brought to the United States for construction and modification, and we're on the verge of doing that.

Senator STEVENS. What's the time frame on that?

General KADISH. I believe that's imminent. I would have to get you the exact date for the record.

[The information follows:]

SEA-BASED X-BAND RADAR

The SBX platform departed Sandefjord, Norway, under tugboat power, on April 25, 2003. It arrived in Brownsville, Texas, on May 30, 2003.

Senator STEVENS. This has been significantly accelerated, as I understand it; is that right?

General KADISH. I'm not sure it's accelerated, but it's an aggressive plan that we had to build this radar. The platform, we were planning on doing it by September 2005, have it in the testbed and part of the test for architecture.

Senator STEVENS. Is that going to be added or part now of the ground-based midcourse defense system?

General KADISH. From a testbed standpoint, yes, and then we will have to decide whether or not it can contribute from an operational standpoint.

Senator STEVENS. Is it planned to move that to various portions of the world to test it?

General KADISH. There is a plan to move it all around the Pacific, to be a part of the tests that we have been describing here. And that's important, because that also has an envelope that we have to characterize. And the disadvantage we have now with the radar we have in Kwajalein is that it's out of place, it's too far back in the trajectory. And these radars are rather huge, this is a 5 million pound radar, the construct it's going to sit on. And the advantage we have is that we can move it around the Pacific, we don't have to place it on land somewhere, and then do the types of trajectory tests that we need to do. So it's key from that standpoint.

Senator STEVENS. I hate to tell you, General, but my mind goes back to the films my son showed me when he was the captain of a king crab boat, a 170-footer, in the Pacific facing 30-foot seas. I hope your people are nautical enough to know what you're doing to put that kind of a weight on a barge and trying to move it around the North Pacific.

General KADISH. That's something we're paying a lot of attention to, Senator. The last thing we want to do is jeopardize that type of an asset. We appear, and I have good confidence in the naval architects that are doing this and all the contractors involved, and I have seen the data on the 100-year wave type of activity, and operationally I don't envision we would be putting it in that kind of harm's way unless we absolutely had to.

Senator STEVENS. Well, respectfully, I don't think you can tell you which direction they are going to come from out there. That earthquake that hit Hawaii put a tidal wave up our inlet, and it came across the sea as a 60-foot wave. Anything that was even anchored on shore in either Hawaii or Alaska was destroyed and a cruise ship. I really seriously question putting that kind of equipment—it's going to be on a platform, it's going to be barge-operated, isn't it, pulled by a barge?

General KADISH. No, it has its own power.

Senator STEVENS. It's self-propelled? What's its dimension, do you remember, how wide is it?

General KADISH. I would have to get the actual numbers for the record but I think it's got, the platform on top is at least 300 yards wide.

[The information follows:]

SEA-BASED X-BAND RADAR

The SBX platform is self-propelled, and when complete it will be able to travel at a maximum rate of approximately 10 knots. Normal transit speed will be approximately 7 knots. The Moss CS–50 platform is 238 feet across at its beam and 389 feet long. It is 137 feet tall, from its keel to the main deck.

Senator STEVENS. So it's self-propelled and 300 yards wide?

General KADISH. This type platform operates in the North Sea today doing oil drilling, so it's designed to be stationary.

Senator STEVENS. I've seen it; in fact, it's Norwegian.

General KADISH. That's right.

Senator STEVENS. It has a drilling rig on it, it didn't have that kind of weight on it. Well, I'm not going to belabor it, but I have serious questions in terms of, you know, the shores of Alaska are just loaded with barges which got struck broadside by a wave.

General KADISH. I understand, and we're taking those concerns to heart, Senator.

MEDIUM EXTENDED AIR DEFENSE SYSTEM (MEADS)

Senator STEVENS. With regard to the MEADS concept, this is an international program now with Germany and Italy, correct?

General KADISH. That's correct, Senator.

Senator STEVENS. Last year we transferred that program to MDA and this budget transfers it back. Is this going to be a ping pong game? Why is it coming back within 1 year?

General KADISH. Well, I think there are a couple reasons for that. One is that the basis of the MEADS program is the PAC–3 missile. As a key component we decided to make that particular weapons system, and overall it is an international practical system designed to take a PAC–3 missile and make the radars and the mobility of this system fit our operating style for the next decade. It is fundamentally an air defense system with a ballistic missile defense capability, basically what Patriot is today.

And so that combination, along with the fact that we're using the Patriot-3 missile which we basically developed already, makes sense to put it under the management of the United States Army as an integrated system, within Patriot, and have a transition from Patriot to a MEADS type of configuration over time. And we discussed this long and hard within the Department, and the overall conclusion is that this is a better way to manage the program and I think you will see management or program improvements as a result of this process. And from an overall funding perspective, it makes sense to integrate these programs within the Army, and that's why you see it coming back into the Army line.

It is more than just budget, it is how we manage the program. Now, we will still have partnership with the Army over its integration into the overall missile defense system and we're working that management linkage today. But fundamentally it needs to be an air defense and ballistic missile defense integrated system, which is best managed with the Army handling those issues. I don't know if you wanted to add anything.

Mr. CHRISTIE. No, I agree with that. In fact, we just had a review of the program, I guess Monday morning, at which these issues were aired in support of the decision to transfer the overall management responsibility to the Army because of the considerations that General Kadish has outlined here.

Senator STEVENS. Have the current problems we have with Germany and Italy at all affected this program?

General KADISH. I think actually we're coming to the end of what we call the Program Definition and Risk Reduction (PDRR) phase, the research and development stage of this program, getting ready to negotiate the next section of the international agreement. And I think overall, they haven't affected the execution of the present program in the process. Now we may need some adjustments as we go forward into the next phase of the program.

Senator STEVENS. This will require a contribution from all three countries to affect this newest phase?

General KADISH. That would be the hope, yes, Senator, so we can share some of the development costs with the partners that are enrolled. If I recall correctly, I think the cost share is somewhere in the neighborhood of 45 percent for our partners and 55 percent for us, so if we can really make this relationship work, we get a better deal from the overall cooperative program.

MDA TESTBED—KODIAK

Senator STEVENS. This is my last question. You made a comment about the Kodiak phase of this, that there would be no interceptors there, just the missiles to be tested, right?

General KADISH. Targets.

Senator STEVENS. The target missiles; is that right?

General KADISH. That's the current plan.

Senator STEVENS. Have you put a schedule out for that, so we will know in advance how many of those will be tested there?

General KADISH. I think we're working on the next 2 years, and we will get you that information.

[The information follows:]

KODIAK TARGETS SCHEDULE

Over the next two years, our current plan shows two tests using the Kodiak Launch Complex. A STARS target launch conducted as part of a GMD Integrated Flight Test in the 1st Qtr fiscal year 2004 and a STARS target launch conducted as part of a GMD Risk Reduction Flight in the 4th Qtr fiscal year 2004. On the first test the target will fly a trajectory towards Kwajalein. The second test will include a target flying a trajectory toward the open ocean area west of Vandenberg AFB.

Senator STEVENS. I was just wondering, how far out is it going, 2 years?

General KADISH. Right now we're working on the next 2 years with the follow-on program right after that.

Senator STEVENS. That's fiscal year 2004?

General KADISH. Fiscal years 2004 and 2005, and then we will work on the next 2-year process as soon as we get that.

Senator STEVENS. Again, I congratulate you. I share Senator Cochran's point of view that utilizing the testbed concept and having some missiles available, due to the tensions that exist in the North Pacific, is a very wise course to be on, and I congratulate you for it. You were ahead of the curve on that one.

Certainly with some of the developments taking place over there now, I just told Senator Inouye, I went home and talked to them about some of the things that have been going on, and our people are very worried about what's going on in North Korea, and we have every reason to worry about it.

But we look forward to perhaps getting a schedule, gentlemen, if you wish, right after we come back, if we could have a classified session, no hearing, just session where you might talk to the people here who are really concerned about the security phase of this, I would appreciate it.

General KADISH. I would be more than happy to, Senator.

Senator STEVENS. Senator Cochran, further questions?

THEATER HIGH ALTITUDE AIR DEFENSE (THAAD)

Senator COCHRAN. Thank you, Mr. Chairman, I do have a couple more questions. One is about the theater high altitude air defense program, which seemed to have gotten off to a pretty fast start, and there was some sense of urgency following the Gulf War that we needed this system. But it seems that it slowed down, and a fairly low risk schedule at this point seems to characterize the program. I wonder what your plans are for your next intercept test. I understand it's not scheduled until fiscal year 2005. Is that going to be a program that's going to go slower rather than faster?

General KADISH. I think, if I may take a crack at that first, I think some of the lessons we learned from that in what we call the PDRR phase in the latter part of the nineties, we took it to heart and as you know, the last two intercepts were very successful, gave us great confidence in proceeding with THAAD and the program.

The program we put together basically redesigned the missile and the processes involved within THAAD as well as some of the radar work to get a much more capable system than what we had been working on, even in the PDRR phase.

That flight test program was laid up, I guess we started that in the 2000 time frame, and we have been working real hard on that. And the first flight tests are still scheduled for late 2004, early 2005, with the first two tests of the missile being a non-intercept test.

And we believe that is exactly the right development approach for us to take and there are two reasons for that. One is that we're doing extensive ground testing right now at the component level so that we can wring out the quality and design flaws at the component level before we assemble them and then test them in these first two or three flight tests. The second reason why I think that's important is that if we are successful in doing what I just described, that I would have high confidence that our early intercept tests would all be successful. And under those conditions, we could move faster with the balance of the program than if we had failures in the overall sequence.

So, I'm expecting now that we are about 30 percent and climbing complete, almost 40 percent overall finished with this design phase, that we will have done the job that I described and we will set the foundation for success and that in the end, we will have made THAAD in a deployed configuration sooner than if he had tried to go faster. And I know that has been a major debate, but only time will tell if we were right about that.

Mr. CHRISTIE. I totally agree with that. I think we learned some harsh lessons, and in fact that's where the term rush to failure was coined in the description of some of the activities that we had underway in THAAD. As General Kadish says, we have backed up and are doing some component testing which have been successful recently, walking before we run and doing this right, so when we get to the actual flight tests of the system next year, the latter part of next year, we will have confidence and we will not encounter some of the problems that we had before.

SPACE TRACKING SURVEILLANCE SYSTEM (STSS)

General KADISH. And I would add one thing. If we add those successes early on, we will find it's taking major risks if we accelerate, and we feel that it is adequate.

Senator COCHRAN. Last year you restructured the Space Based InfraRed System (SBIRS) low program and renamed it STSS. What does that stand for?

General KADISH. Space tracking and surveillance system.

Senator COCHRAN. My question is, it seems to be a less ambitious program than the earlier version. Do you still think that you need to have these advanced tracking systems deployed in space, or are you rethinking that entirely?

General KADISH. I know we're rethinking the combination of sensors we have without the treaty now. We want to make sure that we have the best combination of sensors, and there is a major debate inside the community, if you will, over whether we should have space sensors or land-based or terrestrial-based radars, or a combination of things based on affordability reasons and a whole host of other catch phrases. In my view, that debate is not resolved yet, and the STSS program that we put together is designed to get us more data than just view graphs to base the decision on, and it is important for us to proceed in that regard.

So, we are rethinking the overall sensor requirements for a system without treaty restriction. What I see today does not dissuade me that we do not need to do—I should probably say that I am persuaded that the track we're on is the right track, and we need to get these systems better understood. And a fundamental issue around STSS is whether the long-wave infrared is the appropriate technology to use for that satellite, and we will answer that question with the STSS program.

Senator COCHRAN. Thank you.

Senator STEVENS. Senator Inouye?

Senator INOUYE. Thank you very much.

MISSILE DEFENSE COUNTERMEASURES

Mr. Christie, some of the critics have suggested that very inexpensive countermeasures such as balloons or chaff can foil our very expensive missile defense systems. Are we testing more complex countermeasures and decoys?

Mr. CHRISTIE. As we go on with our flight tests, yes, we will, you know, address more complex countermeasures than we have in the past. You know, one has to step back and think, do these complex countermeasures, we have a difficult time building them ourselves, and we have to wonder what kinds of capabilities are really going to be there with the enemy's system. But yes, we do plan to get into more complex, more difficult countermeasures.

We, again, in the program or test flights that we've had to date, we were trying to demonstrate primarily the hit-to-kill capability, and we were using simple countermeasures to get some idea about the ability of the seeker to discriminate. And again, that was walk before you run, so some of the criticisms I think have been misplaced. You can't just jump in with a massive countermeasure to defeat the purpose of your original test, which was more technology

oriented. But as we go along with our flight tests, our present plan is to increase the complexity of the systems that we are targeting, yes.

MDA TEST SCHEDULE

Senator INOUYE. So you're satisfied with your testing schedule?

Mr. CHRISTIE. Well, as a tester, one would always want to test more, but I understand and support the concepts of the plan that we have underway right now, and I think it's so important that we get this testbed in place in order to overcome some of the artificialities that we have had in our testing to date, which the critics have jumped on. This testbed will permit us to do far more realistic testing, not just in the context of countermeasures, but geometries, velocities that we talked about, crossing angles and other parameters that we need to be looking at in a more realistic fashion.

ADDITIONAL COMMITTEE QUESTIONS

Senator INOUYE. Like my colleagues, I would like to tell you that I am very satisfied with the work your agency is doing, and I for one will be in favor of keeping your roles. But, as you know, my friend from Alaska and I do live in the Pacific, and we do get a little edgy once in a while. Thank you.

Senator STEVENS. Any more questions, Senator?

Senator COCHRAN. No, sir.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL RONALD T. KADISH

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

AGGRESSIVE TESTING SCHEDULE

Question. Thomas P. Christie, Director of Operational Test and Evaluation for the U.S. Department of Defense, cited the past tests lacked realistic positioned midcourse sensor to track incoming enemy missiles and variety in test intercept locations, and asserts more stringent and improved testing procedures are needed to ensure the success of the program.

Can you confirm that we have in fact embarked on an aggressive testing schedule that adequately addresses the real world intercept and decoy scenarios a missile defense system may face?

Answer. Yes, I can confirm that both the ground and flight testing that is planned for the BMDS system and its elements are aggressive and build in complexity, to include more realistic test geometries and more sophisticated countermeasures. One of the characteristics of the capabilities based approach is to take manageable steps toward the objective system, while learning how to improve performance and expand coverage based on its performance during earlier block testing. This is particularly important in and evolving threat environment.

AVAILABILITY OF A MATURE EFFECTIVE BMDS

Question. At our current rate of testing and development, when do you think we will have the technological maturity to fully field an effective missile defense system?

Answer. Since the state of threat technology continues to progress, we will have to continually improve BMDS performance and verify new capabilities through testing. This will include conducting tests against new, more challenging targets, and associated countermeasures. In this respect, technological maturation will continue even after full fielding is realized. If we successfully complete testing that is currently scheduled, I believe that we will improve the BMDS and, more importantly, our confidence in its performance, so that by the end of the decade we will have

a well-characterized capability that can be relied upon. It is more difficult to predict whether or not countermeasures designed to defeat the BMDS will keep pace with development.

BOOSTER ENHANCEMENTS FOR AEGIS

Question. Before deployment, the Sea and Ground Based Mid-Course segment will need to improve the effectiveness of the Standard Missile-3 (SM–3) to intercept ICBMs during the ascent phase of mid-course flight. To achieve this, the current SM–3 will need to be larger and faster than the current model used for testing.

Is the improved SM–3 ready for testing?

Answer. Because the Block 04 Aegis BMD is not intended to engage ICBMs, only SRBMs and MRBMs, no propulsion improvements to the SM–3 missile are currently planned. Consequently, readiness for testing becomes moot.

NO AEGIS BOOST PHASE CAPABILITY IN BLOCK 04

Question. If not, will any delay dramatically affect the capabilities of the Block 04 system the administration is looking to deploy?

Answer. The lack of an enhanced booster for the Aegis BMD system will not affect the capabilities of the Block 04 system. The role of Aegis in the Block 04 system will be to provide engagement capability against SRBMs and MRBMs, surveillance and tracking of long-range targets, automatic search and acquisition of a target from a cue provided by an external sensor, and limited ship self defense. The target cue provided by Aegis will be used by the Ground-based Midcourse element of the Testbed to launch ground-based interceptors at the threat. Subsequent block development will include the enhancements to the Aegis Weapon System for IRBM capability.

Question. The 2004 missile defense budget is seeking $7.7 million for RDT&E (research, development, test and evaluation).

Given the high costs that have already been projected for RDT&E, based upon current research and success, what do you estimate the complete layered system will cost?

Answer. As directed by the President, we have a near-term architecture for a limited missile defense system. A capabilities-based architecture provides the flexibility to evolve the system over time in response to changes in threat and technology. Fielding opportunities occur throughout the development, starting with Block 2004. The cost of a "complete" system is unknowable at this time because the threat we may have to counter is unknowable. We're embarking on an affordable R&D program that fields modest capabilities in fiscal year 2004 and then improves them over time to keep pace with an evolving threat.

Question. The completed ballistic missile defense system will need to be an overlapping system-of-systems that is reliable, robust, capable of incorporating up-grade features as their feasibility is demonstrated, and able to engage threats at each stage of their employment-boost phase, midcourse, and terminal. The President requested to have a missile defense system in place by fiscal year 2004 and the implementation of a final overlapping system-of-systems by fiscal year 2010.

Based on the current success of the program, do you believe that this milestone will be met?

Answer. We have an aggressive RDT&E program that is on track to develop a set of missile defense capabilities for initial defensive operations in fiscal year 2004. Our recent testing and analysis gives us confidence in responding to the President's December direction to deploy an initial capability, and we will continue robust RDT&E to build on that initial capability in an evolutionary manner to keep pace with emerging threats and technological advances.

Question. In the fiscal year 2004 budget request, there was a request for an exemption of further operational testing of the ballistic missile defense system. In March, the Undersecretary of Defense, Edward Aldridge announced, "It was not our intent to waive operational testing."

If the intent was not to exempt testing prior to fielding the weapon system, what was the purpose of the exemption request?

Answer. The question refers to proposed section 8061, which read in full:

"Sec. 8061. Funds available to the Department of Defense under the heading, 'Research, Development, Test and Evaluation, Defense-Wide' may be used to develop and field an initial set of missile defense capabilities, and such fielding shall be considered to be system development and demonstration for purposes of any law governing the development and production of a major defense acquisition program. The initial set of missile defense capabilities is defined as 'Block 04' Ballistic Missile Defense system fielded in fiscal year 2004 and 2005. Subsequent blocks of missile de-

fense capabilities shall be subject to existing laws governing development and production of major defense acquisition programs."

This was not drafted to waive operational testing, as the fielded developmental items will continue to be tested. However, we understand concerns that the language "and such fielding shall be considered to be system development and demonstration for purposes of any law" would have that effect, and agree to delete it and all that follows.

Question. Does testing under the guidelines of the Director of Operational Testing and Evaluation negatively impact the program?

Answer. No, the program is not negatively impacted by DOT&E testing guidelines. MDA and DOT&E have established an effective working relationship. DOT&E is a member of the Missile Defense Support Group and provides testing advice to the Director, MDA and to USD (AT&L). Additionally, DOT&E produces a congressionally directed annual report on the status and effectiveness of the MDA test program.

Question. What is the current MDA position on this request?

Answer. MDA supports striking all after "capabilities", so that Sec. 8061 will read as follows: "Funds available to the Department of Defense under the heading, 'Research, Development, Test and Evaluation, Defense-Wide' may be used to develop and field an initial set of missile defense capabilities."

QUESTIONS SUBMITTED TO THOMAS P. CHRISTIE

QUESTION SUBMITTED BY SENATOR KAY BAILEY HUTCHISON

Question. Is the Theater High Altitude Area Defense program experiencing a shortfall in funding that will delay the program's progress? If so, please explain your plan to remedy the situation.

Answer. The THAAD program is not experiencing a shortfall in funding that would delay the program's progress. The THAAD element just completed a program re-plan that provides for the most efficient use of resources, the most effective program schedule, and realigns the flight tests for a balanced program. The program is progressing well in Block 04 and executing on plan to initiate Block 04 flight-testing with first flight in 4QFY 2004, followed by four additional flight tests to be conducted before the end of Block 04 (December 2005). The THAAD program is currently engaged in intensive piece part, assembly, and component ground testing to assure Block 04 flight test success.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

Question. Mr. Christie, in your statement, you mentioned your initial assessment (annual review) concluding the GMD (Ground-based Midcourse Defense) element of the BMDS has not yet demonstrated operational capability is based on the fact that many essential components of the GMD element have not yet been built.

What are these components?

Answer. Booster motors, sea-based radar (x-band), missile silo complex at Fort Greely and Vandenberg.

Question. Are any of these components scheduled for procurement at a later block?

Answer. *Booster motors*.—Booster motors that are currently under development will be used for the Block 2004 Test Bed and initial defensive operational capability. Testing of the OSC and BV+ boosters is a high priority for MDA, and there will be four flight tests (two booster verification flights and two integrated flight tests with simulated intercepts) during the rest of this fiscal year.

SBX.—The SBX is planned to be added to Block 2004 at the end of 2005.

Missile silo complex at Fort Greely and VAFB.—The silos at Fort Greely are currently under construction as part of the Block 2004 initial GMD parts of the BMDS Test Bed and IDO capability. The additional silos at VAFB will be renovated to support Block 2004 IDO.

Question. When should we expect the essential components to be fielded?

Answer. *Booster motors*.—Booster motors will be fielded in the initial defensive operational capability no later than September 30, 2004.

SBX.—The SBX is planned to be added to Block 2004 at the end of 2005.

Missile silo complex at Fort Greely and VAFB.—Six silos at Fort Greely and four at VAFB will be a part of the initial defensive operations capability fielded in 2004.

Question. When will the MDS be accurately tested for operational capability?

Answer. With the President's decision to field an initial set of missile defense capabilities, we now have a clear, basic, near-term architecture for a limited system to address a range of missile threats. The initial testbed will be used to test maturing BMD systems as they become available to evaluate the operational capability of the system.

Current testing of the Ground-Based Midcourse Defense (GMD) Element developmental prototype is structured as combined Developmental Testing/Operational Testing (DT/OT), occurring in a Combined Test Force (CTF) environment. A CTF environment brings together developmental and operational testers from both the prime contractor team and the government in a common forum to plan and execute all testing in accordance with combined DT and OT objectives to the maximum extent practicable. Because GMD is an evolutionary development, at designated intervals this process culminates in BMD Elements characterization, performed by the Operational Test Agencies (OTAs), i.e., Army Test and Evaluation Command (ATEC), Air Force Operational Test and Evaluation Center (AFOTEC), and Joint Interoperability Test Command (JITC).

The Aegis Ballistic Missile Defense Program has a Memorandum of Agreement with Commander, Operational Test and Evaluation Force (COMOPTEVFOR), the Navy's OTA, to participate in the planning and observe all Aegis BMD Block 04 testing. Within 60 days of the conclusion of each test, COMOPTEVFOR provides a "Letter of Observation" which provides formal OTA feedback regarding system performance to the Program Director, Aegis BMD. COMOPTEVFOR's recommendations are then considered and, if possible, implemented in subsequent testing. Flight Mission 9, which is currently the last test of the Aegis BMD Block 04 program, is currently being planned as a combined DT/OT in that COMOPTEVFOR will conduct a formal Operational Assessment of the system.

Current planning efforts for Initial Defensive Operations (IDO), scheduled to be in place on September 30, 2004, include the identification of test objectives based upon element interoperability; Command and Control, Battle Management, and Communication (C^2BMC); Engagement sequences, and Warfighter operational control issues. These will be overlayed onto GMD and Aegis BMD element tests scheduled between now and IDO that will afford an opportunity for an operational assessment of BMDS Initial Defensive Capability (IDC). Tests will be conducted in the BMDS Test Bed with operational configurations and user participation.

Question. Mr. Christie, if the initial fielding of the BMDS is to develop a testbed for further research and not employ an actual defense system, wouldn't it be more cost effective to complete the testing under the initial fielding, with minimum missiles, than to field the budget request and have to go back later to retrofit?

Answer. Before the President's December decision to deploy a missile defense, the fiscal year 2003 President's Budget reflected the development of a set of test bed capabilities that could be made operational. The fiscal year 2004 President's Budget I, based on the President's direction, asks Congress to authorize and appropriate funds to allow us to add to this test bed and make it operational in 2004. Therefore, instead of building a test bed that might be used operationally, we are fielding an initial defensive capability that we will continue to test.

There is tremendous benefit to fielding this unprecedented technology, in manageable increments, to provide some defense, to learn more about it, gain experience with it, and improve it over time. To achieve this benefit for MDA and our warfighters, we must have the assets and infrastructure in the field if we are going to begin to test the system under operationally realistic conditions. If we do not have the weapons and sensors fielded at operationally useful locations, we cannot realize these benefits and ensure the integrated system works in a useful manner for our military.

Additionally, there is historical precedence in this approach as evidenced with development of our first reconnaissance satellites and land- and sea-based ballistic missiles. Urgent national security requirements pressed us to deploy capability soon, and through trial and error we did. The parallels between these pioneering programs and the missile defense program are clear.

Our test bed evolutionary approach to initial defensive capability is rational from a cost standpoint as well. We do not now have adequate understanding of our long-term architecture to submit a budget for many tens of billions of dollars, and we don't need to submit such a budget to achieve our goals in the interim. We are able to purchase and field capabilities in small numbers and this approach will allow us to control costs and mitigate the requirement for retrofitting.

Finally, we have to strike a balance between our desire for perfection in missile defenses that we deploy, and our desire to have, as soon as possible, some defensive capability where none exists today.

SUBCOMMITTEE RECESS

Senator STEVENS. Thank you very much, General Kadish and Mr. Christie. We appreciate you being with us this morning and look forward to you talking to us after the recess.

The subcommittee will next meet on April 30 for the defense medical program hearing. Thank you very much.

[Whereupon, at 11:17 a.m., Wednesday, April 9, the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, April 30.]